of House bill 11137; to the Committee on the Merchant Marine and Fisheries.

5145. Also, petition of American Broadcasters' Association, embodied in telegram from President Norman Baker, declaring that true conditions misrepresented regarding radio situation, and praying for prolongation of life of Radio Commission; to the Committee on the Merchant Marine and Fisheries.

5146. By Mr. MAGRADY: Petition of numerous citizens of Danville, Pa., protesting against the passage of House bill 78, or any other bill providing for compulsory Sunday observance; to the Committee on the District of Columbia.

5147. Also, petition of numerous citizens of Columbia County, Pa., protesting against the passage of House bill 78, or any other bill providing for compulsory Sunday observance; to the Committee on the District of Columbia.

5148. By Mr. MEAD: Petition of residents of Erie County, N. Y., in opposition to the Lankford Sunday observance bill; to the Committee on the District of Columbia.

5149. By Mr. MONAST: Petition of citizens of Pawtucket, R. I., protesting against compulsory Sunday laws; to the Committee on the District of Columbia.

5150. By Mr. NEWTON: Petition presented by members of "Esther Young" Woman's Christian Temperance Union, Minneapolis, requesting favorable support of Stalker bill (H. R. 9598); to the Committee on the Judiciary.

5151. Also, petition presented by members of "Hobart Union," Woman's Christian Temperance Union, Minneapolis, requesting favorable support of Stalker bill (H. R. 9598); to the Committee on the Judiciary.

5152. By Mr. O'CONNELL: Petition of the Connecticut committee on the big navy bill, Hartford, Conn., with reference to the naval program and the Gillett resolution for further action on the World Court; to the Committee on Naval Affairs.

5153. Also, petition of the National Fertilizer Association, Washington, D. C., with reference to the present fertilizer situation in the United States; to the Committee on Agriculture.

5154. Also, petition of the Knights of Columbus, New York State Council, Buffalo, N. Y., favoring legislation enactment which will provide for full Federal responsibility in respect to future protection measures in the lower Mississippi Valley; to the Committee on Flood Control.

5155. Also, petition of the Federal Wild Fowl Protection Association of Stamford, Conn., favoring the passage of Senate bill 2917; to the Committee on Agriculture.

5156. Also, petition of the New York State Council of Churches, New York City, N. Y., opposing a large naval building program as proposed by the Navy Department; to the Committee on Naval Affairs.

5157. Also, petition of the Citizens' Medical Reference Bureau, New York City, opposing the passage of House bills 8128 and 11026, for coordination of health activities and Gorgas Memorial Laboratory; to the Committee on Foreign Affairs.

5158. Also, petition of H. D. Bob Co. (Inc.), New York City, N. Y., favoring the passage of the Hawes-Cooper bill (S. 1940 and H. R. 7729); to the Committee on Labor.

5159. By Mr. REED of New York: Petition of residents of Belfast, N. Y., in behalf of Civil War pension bill; to the Committee on Invalid Pensions.

5160. By Mr. ROBINSON of Iowa: Petition signed by Caroline Scherr, of 2071 Elm Street, Dubuque, Iowa, and about 70 other citizens of Dubuque, Iowa, protesting against the passage of the Sunday compulsory observance bill, or any other like bill enforcing the observance of the Sabbath; to the Committee on the District of Columbia.

5161. By Mr. SCHAFER: Petition of various residents of Wisconsin, protesting against the passage of House bill 78, or any similar compulsory Sunday observance legislation; to the Committee on the District of Columbia.

5162. By Mr. SELVIG: Resolution of Hon. Mike Holm, Minnesota secretary of state; J. P. Bengston, assistant secretary of state; and others living in St. Paul, Minn., in favor of the repeal of the national-origins clause and in favor of the present quota disposition and against further measures of reductions of the Scandinavian quotas; to the Committee on Immigration and Naturalization.

5163. By Mr. SHALLENBERGER: Petition of citizens of Nebraska; to the Committee on the District of Columbia.

5164. By Mr. THATCHER: Petition of numerous citizens of Louisville, Ky., and vicinity, protesting against the enactment of compulsory Sabbath observance legislation; to the Committee on the District of Columbia.

5165. By Mr. VINCENT of Michigan: Petition of residents of Saginaw, Mich., protesting against the passage of House bill 78, or any other bill providing compulsory Sunday observance; to the Committee on the District of Columbia.

5166. By Mr. WATSON: Resolution passed by the State executive committee of the American Legion, favoring the Navy program outlined by President Coolidge and the Secretary of the Navy; to the Committee on Naval Affairs.

5167. Also, petition of Pennsylvania State Chamber of Commerce, by George E. Foss, general secretary, protesting against House bill 6511, introduced by Representative SIROVICH; to the Committee on Labor.

5168. Also, petition of Department of Pennsylvania, Veterans of Foreign Wars of the United States, indorsing plan of President Coolidge for an adequate United States Navy; to the Committee on Naval Affairs.

5169. By Mr. WASON: Petition of 25 residents of Concord, N. H., protesting against the passage of House bill 78, known as the Sunday closing bill; to the Committee on the District of Columbia.

5170. By Mr. YON: Petition of P. P. Anderson and other citizens of Pensacola, Fla., protesting against the passage of the Lankford Sunday observance bill; to the Committee on the District of Columbia.

SENATE

FRIDAY, *March 9, 1928*

(Legislative day of Tuesday, March 6, 1928)

The Senate reassembled at 12 o'clock meridian, on the expiration of the recess.

The VICE PRESIDENT. The Senate will receive a message from the House of Representatives.

MESSAGE FROM THE HOUSE—ENROLLED BILLS SIGNED

A message from the House of Representatives, by Mr. Haltigan, one of its clerks, announced that the Speaker had affixed his signature to the following enrolled bills, and they were signed by the Vice President:

S. 1531. An act authorizing the Secretary of Agriculture to sell the Weather Bureau station known as Mount Weather, in the counties of Loudoun and Clarke, in the State of Virginia;

H. R. 9293. An act granting the consent of Congress to the Highway Department of the State of Tennessee to construct, maintain, and operate a bridge across the Clinch River on the Sneedville-Rogersville road, in Hancock County, Tenn.; and

H. R. 9843. An act to extend the times for commencing and completing the construction of a bridge across the Kanawha River in or near Henderson, W. Va., to a point opposite thereto in or near Point Pleasant, W. Va..

CALL OF THE ROLL

Mr. CURTIS. Mr. President, I suggest the absence of a quorum.

The VICE PRESIDENT. The clerk will call the roll.

The legislative clerk called the roll, and the following Senators answered to their names:

Ashurst	Edge	Kendrick	Sackett
Barkley	Edwards	Keyes	Schall
Bayard	Ferris	King	Sheppard
Bingham	Fess	La Follette	Shipstead
Black	Fletcher	McKellar	Simmons
Blaine	Frazier	McLean	Smith
Blease	George	McMaster	Smoot
Borah	Gerry	McNary	Steck
Bratton	Glass	Mayfield	Steiwer
Brookhart	Gooding	Neely	Stephens
Broussard	Gould	Norbeck	Swanson
Bruce	Greene	Norris	Thomas
Capper	Hale	Nye	Tydings
Caraway	Harris	Oddie	Tyson
Copeland	Harrison	Overman	Wagner
Couzens	Hawes	Phipps	Walsh, Mass.
Curtis	Hayden	Pine	Walsh, Mont.
Cutting	Heflin	Pittman	Warren
Dale	Howell	Ransdell	Waterman
Deneen	Johnson	Reed, Pa.	Wheeler
Dill	Jones	Robinson, Ark.	Willis

The VICE PRESIDENT. Eighty-four Senators having answered to their names, a quorum is present.

PETITIONS AND MEMORIALS

Mr. LA FOLLETTE presented memorials of sundry citizens of Grant County, Wis., remonstrating against adoption of the proposed naval building program, which were referred to the Committee on Naval Affairs.

Mr. PHIPPS presented a petition of sundry citizens of Denver, Colo., praying for the passage of legislation granting increased pensions to Civil War veterans and their widows, which was referred to the Committee on Pensions.

Mr. BROOKHART presented a memorial of sundry citizens of Wapello County, Iowa, remonstrating against control of radio

broadcasting by chain-station hook-ups of large companies, which was referred to the Committee on Interstate Commerce.

He also presented a petition of the council of the Parent-Teacher Association of Ottumwa, Iowa, praying for the passage of legislation creating a Federal department of education, which was referred to the Committee on Education and Labor.

He also presented petitions of sundry citizens of Dysart, Ottumwa, and Cedar Rapids, all in the State of Iowa, praying for the passage of legislation granting increased pensions to Civil War veterans and their widows, which were referred to the Committee on Pensions.

Mr. BLAINE presented the petition of Hans Vigdahl and 61 other citizens of Janesville, Wis., praying for the passage of the so-called Shipstead bill, being the bill (S. 1481) to amend sections 11 and 12 of an act to limit the immigration of aliens into the United States, and for other purposes, approved May 26, 1924, which was referred to the Committee on Immigration.

Mr. JOHNSON presented 24 petitions numerously signed by sundry citizens of the State of California, praying for the passage of legislation granting increased pensions to Civil War veterans and their widows, which were referred to the Committee on Pensions.

Mr. COPELAND presented petitions of sundry citizens of Waverly and Highland Falls, N. Y., praying for the passage of legislation granting increased pensions to Civil War veterans and their widows, which were referred to the Committee on Pensions.

He also presented a resolution adopted by the committee on cooperation of the United Synagogue of America, which was referred to the Committee on Finance and ordered to be printed in the RECORD, as follows:

The committee on cooperation of the United Synagogue of America in its desire to help stamp out the horrors of narcotic drug addiction, with the resultant menace to the health, morals, and safety of the country, pledges itself to cooperate in organized efforts to remedy the great evil which threatens the physical and moral welfare of society. Accordingly it urges upon Congress the enactment, as soon as practicable, of the Porter and Shortridge bills, which are designed to restrict the peddling of narcotics and effectively to cure the victims of addiction to the use of narcotic drugs.

PROGRESS OF TRANSOCEANIC AIR NAVIGATION

Mr. BINGHAM. Mr. President, on February 28 last the Senate was kind enough to listen to some remarks I then made in regard to rigid airships. A number of persons have since expressed some doubt with regard to statements then made. I wish to say that I took the matter up with the National Advisory Committee for Aeronautics, a body which is composed, as the Senate knows, of a number of the highest authorities on aeronautics in this country, and possibly in the world. Their publications are eagerly welcomed in all aeronautical circles. I ask unanimous consent to have my letter to the committee and their answer in regard to the subject of rigid dirigibles printed in the RECORD and referred to the Committee on Naval Affairs.

There being no objection, the letter and communication were referred to the Committee on Naval Affairs and ordered to be printed in the RECORD, as follows:

UNITED STATES SENATE,
February 16, 1928.

The NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS,
3841 Navy Building, Washington, D. C.

GENTLEMEN: I would greatly appreciate having you answer, from the information which you have available, the following questions regarding the development and operation of large rigid airships:

First. In the opinion of the National Advisory Committee for Aeronautics, does the present state of the art of constructing and operating large rigid airships justify the belief that such airships can be constructed and operated successfully?

Second. What, in the opinion of the committee, are the most practical steps that can be taken at this time to encourage the development of an airship industry in the United States, looking toward the promotion of commercial air navigation by rigid airships?

Thanking you in advance for your courtesy in giving attention to this request, believe me,

Sincerely yours,

HIRAM BINGHAM.

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS,
Washington, D. C., March 1, 1928.

Hon. HIRAM BINGHAM,
United States Senate, Washington, D. C.

DEAR SENATOR BINGHAM: Your letter dated February 16, 1928, making certain inquiries as to the opinion of the National Advisory Committee for Aeronautics with reference to the construction and operation of rigid airships and the development of an airship industry in the United States was considered at a meeting of the executive committee held March 1, 1928, and the following resolutions were adopted:

"*Resolved*, That it is the opinion of the National Advisory Committee for Aeronautics that the present state of the art of constructing and operating large rigid airships has progressed to the point where we are justified in believing that large rigid airships can be constructed and operated successfully; and

"*Resolved further*, That it is the opinion of the National Advisory Committee for Aeronautics that the most practical step to be taken at the present time to encourage the development of an airship industry in the United States is to begin the construction of the airships authorized under the five-year aircraft building program. The construction of these airships will foster the development of an airship industry; and this, with the knowledge to be acquired from experience in the operation of airships, will be necessary in order to enable the United States to meet the needs for commercial airship construction and operation when they arise."

The committee appends hereto a memorandum, entitled "The present status of the development of rigid airships in the United States," which states the facts on which its opinion is based.

Sincerely yours,

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS,
JOSEPH S. AMES, *Chairman.*

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS,
Washington, D. C., March 1, 1928.

THE PRESENT STATUS OF THE DEVELOPMENT OF RIGID AIRSHIPS IN THE UNITED STATES

CONSTRUCTION

No rigid airship has been built in this country since the *Shenandoah* was completed in 1923, but theoretical studies, research, and practical tests have continued, so that ultimately additional rigid airships might be designed and built in the United States. As a result, the United States is to-day as fully abreast of rigid airship development as could be expected without actual construction since 1923.

The *Shenandoah* was a remodeled copy of a 1916 German design, and when completed was recognized as an admirable first American effort rather than as a modern rigid airship. The necessity for providing suitable materials for the *Shenandoah* led to the further development of aluminum alloys and brought to the United States expert talent who knew how to manufacture gas cells. Additional technical experts were brought to this country who were familiar with rigid airship fabrication, erection, and operation. Original thought and effort were expended along various lines connected with theoretical designs, with the result that in spite of meager information as to the prototype, the design of the *Shenandoah* was placed upon a sound basis. A special subcommittee of the National Advisory Committee for Aeronautics checked the design and found it reasonable. Recent information confirms this opinion.

The *Shenandoah* was operated successfully by the Navy for two years. Her operation proved the practicability of mooring masts ashore and afloat. She made a number of notable flights, including one of 9,000 miles to the west coast and return, during which she was based entirely on mooring masts for 21 days. A noteworthy flight resulted from a breakaway from the mooring mast. During this she weathered a gale in a badly damaged condition. The fact that she was finally caught in an unusually severe storm and succumbed to it is no reason to condemn her as an airship—much less to condemn airships in general. Engineering history is full of instances where final success has been reached only through lessons learned in early attempts.

The acquirement in 1924 of the *Los Angeles*, as an example of modern German airship construction, was an important step in airship development in the United States. With the *Los Angeles* there came much information about questions hitherto obscure. Shortly after the *Los Angeles* arrived there was brought to this country a group of the most experienced rigid-airship engineers. They still remain and represent the quarter of a century of Germany's experience in airship design and construction.

The United States began its experience with rigid airships nearly 10 years ago, and the present "state of the art" may be summarized as follows: One rigid airship was built and operated successfully; another was acquired and is still being operated successfully; much thought and effort have been applied to engineering problems connected with airships; technical personnel familiar with airship matters are available, including those self-trained in the United States; the technical knowledge and experience available in the United States for the design and construction of rigid airships is ample; satisfactory materials are available, notable examples being aluminum alloys, steel wire, cotton cloths, gas-cell materials of various kinds, engines, and power-plant equipment, including water-recovery apparatus; promising development of oil-burning engines is under way; and helium, available only in the United States, gives to American airships a unique measure of safety.

From a technical standpoint it is believed the United States is prepared to design and build rigid airships to any required degree of engineering exactitude. American ingenuity and production methods applied to airship construction will cheapen their cost and offset the present high-cost differential between American and foreign airships.

OPERATION

The successful operation of rigid airships depends on two factors—(a) trained personnel, and (b) facilities available, which include weather-information service. Operation is also a matter of experience. Although our experience is not as wide as that possessed by the Germans or English, it is more recent.

The American personnel engaged in rigid-airship operation is the equal of any. They have been largely self-taught, but the foundation of the training was sound and embodied the best of German and British experiences adapted to American conditions and to helium operation. As only one rigid airship has been in operation at a time, competitive effort has not been possible. Development would be faster if more rigid airships were available. The large cost of rigid airships and the fact that only one is now available forced a cautious, conservative scheme of operation which, though sound, has not as yet allowed the technique of rigid-airship operation to develop to the full extent of its possibilities. This situation will correct itself when more airships and better facilities are available.

The facilities for the operation of rigid airships in the United States are not the best, and additional facilities are needed. There are only two large sheds—at Lakehurst and at Scott Field. The former, in particular, is poorly located from a meteorological standpoint. The shortage of helium and meager facilities for its transportation and storage have retarded the operation of rigid airships at intervals. Several mooring masts have been erected at strategic points, but the masts remote from the shed base have been used only once.

Arrangements and mechanical appliances for landing airships and handling them on the ground, and in or out of sheds, are being improved with experience. As a result we should be prepared to handle the larger airships now contemplated with no more difficulty, and perhaps with less difficulty, than airships of the *Los Angeles* size. There has been gratifying progress in developing the floating mast, the fixed stub mast, the mobile stub mast, mechanically operated docking trolleys, cars for supporting airships while moving in and out of sheds, artificial superheat device, remote control for hauling down winches, and the deck landing platform.

The operation of airships, like airplanes, is influenced by weather conditions and will be facilitated by improved weather information service. A new system for the collection and distribution of weather reports has recently been worked out by the Weather Bureau in cooperation with the telegraph companies. This will much facilitate the prompt furnishing of aerological information so necessary for the safe navigation of the air.

FOREIGN DEVELOPMENT

No survey of rigid airship development would be complete without a résumé of what is being done by other nations.

Germany, the original home of the rigid airship, and where it finds most enthusiastic support, is just completing a 3,650,000 cubic foot airship, funds for which were raised largely by popular subscription. It is proposed that this airship, after making demonstration flights, including one to the United States, will be used to start a commercial line between Spain and South America. The design is a modern and enlarged copy of the *Los Angeles*. This airship will carry a large portion of its fuel in gaseous form. This permits an important increase in cruising range. This development is being watched with interest, and a combination of helium and a fuel gas offers attractive possibilities without much greater risk than with helium alone and gasoline.

Great Britain, after abandoning airships for the sake of economy in 1919, and after being confirmed in her antiairship convictions by the *R–38* disaster in 1921, executed an about face in 1923 and resumed the construction of rigid airships. Great Britain now believes airships will play an important rôle in linking up her outlying possessions.

Two rigid airships of 5,000,000 cubic feet volume and using hydrogen are nearly completed. One of these is being built by the air ministry, the other by the Airship Guarantee Co., a subsidiary of Vickers (Ltd.). From all information available the designs appear to be on a sound basis, and there is no reason to doubt their success. The Airship Guarantee Co. uses a novel and ingenious type of girder which promises to simplify and cheapen the structural parts of an airship. The air ministry airship will use considerable alloy steel. Oil-burning engines are proposed for both airships, but they are not yet sufficiently developed to be pronounced satisfactory. Each airship is fitted with accommodations for about 100 passengers, and both are intended for quasi-subsidized commercial service to India.

Great Britain has five shed berths for large rigid airships. A new shed has been erected in India, and one shed in England is being enlarged. Mooring masts have been built in England, India, and Egypt. Other masts are contemplated in Canada, Australia, and South Africa.

At least one of these British airships is expected to visit the United States during the summer of 1928.

France has several sheds suitable for large rigid airships, but probably for reasons of economy has not built such craft. Designs are available and she contents herself with trying to keep abreast of development without building or operating.

Italy still operates the small rigid airship *Esperia*, delivered to her in 1922 by Germany. Italy's own airship efforts, however, are concentrated on developing the semirigid type, which satisfies her geographic requirements. An enlargement of the *Norge* type is under construction. In her chosen field of moderate-sized airships Italy has developed a superior technique of design, construction, and operation.

REPORTS OF COMMITTEE ON FINANCE

Mr. SMOOT, from the Committee on Finance, to which were referred the following bills, reported them each without amendment and submitted reports thereon:

A bill (H. R. 367) to authorize the settlement of the indebtedness of the Kingdom of the Serbs, Croats, and Slovenes (Rept. No. 506); and

A bill (H. R. 10954) to authorize the Secretary of the Treasury to execute agreements of indemnity to the Union Trust Co., Providence, R. I., and the National Bank of Commerce, Philadelphia, Pa. (Rept. No. 507).

Mr. WALSH of Massachusetts, from the Committee on Finance, to which was referred the bill (H. R. 7224) to extend the time for the refunding of certain legacy taxes erroneously collected, reported it without amendment and submitted a report (No. 508) thereon.

ENROLLED BILL PRESENTED

Mr. GREENE, from the Committee on Enrolled Bills, reported that on March 9, 1928, that committee presented to the President of the United States the enrolled bill (S. 1531) authorizing the Secretary of Agriculture to sell the Weather Bureau station known as Mount Weather, in the counties of Loudoun and Clarke, in the State of Virginia.

BILLS AND JOINT RESOLUTION INTRODUCED

Bills and a joint resolution were introduced, read the first time, and, by unanimous consent, the second time, and referred as follows:

Mr. NORRIS. At the request of the Attorney General, I introduce a bill, which, together with the letter of the Attorney General, I ask may be referred to the Committee on the Judiciary.

The bill (S. 3572) authorizing an appropriation for the purpose of defraying expenses incident to the making of a comprehensive survey covering the requirements of a Federal penal system (with an accompanying paper); to the Committee on the Judiciary.

By Mr. JONES:

A bill (S. 3573) relating to certain war veterans and widows in the classified civil service of the United States, and for other purposes; to the Committee on Civil Service.

By Mr. McNARY:

A bill (S. 3574) to extend the benefits of the act entitled "An act granting pensions to certain soldiers who served in the Indian wars from 1817 to 1898, and for other purposes," approved March 3, 1927, to certain members of Company B, Second Regiment Oregon State Militia; to the Committee on Pensions.

By Mr. CAPPER:

A bill (S. 3575) to amend the grain futures act; to the Committee on Agriculture and Forestry.

By Mr. McKELLAR:

A bill (S. 3576) for the erection of tablets or markers at Camp Blount, Lincoln County, Tenn.; to the Committee on the Library.

By Mr. SACKETT:

A bill (S. 3577) granting a pension to Rosanna Sanders (with accompanying papers);

A bill (S. 3578) granting a pension to Joseph T. Pike (with accompanying papers);

A bill (S. 3579) granting an increase of pension to Maud E. Harper (with accompanying papers); and

A bill (S. 3580) granting an increase of pension to Martha A. Wilson (with accompanying papers); to the Committee on Pensions.

By Mr. CAPPER:

A bill (S. 3581) authorizing the Commissioners of the District of Columbia to settle claims and suits against the District of Columbia; to the Committee on the District of Columbia.

By Mr. BINGHAM:

A joint resolution (S. J. Res. 110) to provide for annexing certain islands of the Samoan group to the United States; to the Committee on Territories and Insular Possessions.

AMENDMENT TO CENSUS BILL

Mr. ROBINSON of Arkansas submitted an amendment intended to be proposed by him to the bill (H. R. 393) making

provision for the fifteenth and subsequent censuses, which was referred to the Committee on Commerce and ordered to be printed.

PENSIONS AND INCREASE OF PENSIONS

Mr. JONES submitted an amendment intended to be proposed by him to the bill (H. R. 10159) granting pensions and increase of pensions to widows and former widows of certain soldiers, sailors, and marines of the Civil War, and for other purposes, which was referred to the Committee on Pensions and ordered to be printed.

AMENDMENTS TO TAX REDUCTION BILL

Mr. SHEPPARD submitted an amendment and Mr. STEPHENS submitted two amendments intended to be proposed by them, respectively, to House bill 1, the tax reduction bill, which were severally referred to the Committee on Finance and ordered to be printed.

SUPERVISION OF NICARAGUAN ELECTION

Mr. NORRIS submitted the following resolution (S. Res. 164), which was read and referred to the Committee on Foreign Relations:

Whereas on March 6 (calendar day, March 7), 1928, the Committee on Foreign Relations made a report to the Senate (Rept. No. 498, 70th Cong., 1st sess.) upon S. J. Res. 57, in which report the committee states that the Government of the United States made an agreement with the Government of Nicaragua to supervise an election in Nicaragua, and that by virtue of said agreement the so-called liberal faction in Nicaragua had laid down their arms upon the promise of the United States Government to supervise said election, and that to withdraw our troops at this time from Nicaragua would be a violation of said agreement; and

Whereas it appears from said report that the President of the United States had been requested by the Nicaraguan Government to supervise the election in that country in 1928 and had accepted such request, and that the President, through his personal representative, Henry L. Stimson, had notified the liberal faction in Nicaragua of such acceptance and of his intention to supervise such election, and that he intended to supervise said election regardless of what action might be taken by the liberal faction in said country, and that under these conditions the liberal forces, under said ultimatum, had surrendered their arms and agreed to such supervision on the part of the armed forces of the United States: Now therefore be it

Resolved, That the Committee on Foreign Relations, after making such investigation as in its judgment is proper, is hereby directed to report to the Senate:

1. What, if any, authority did the President of the United States have to accept such invitation on the part of the Nicaraguan Government to supervise an election in Nicaragua?

2. If the committee finds that the President of the United States did have such authority, then it is directed to report to the Senate whether, in its judgment, the same authority does not give the President of the United States the right to supervise any election in any foreign country.

3. If the President of the United States does not possess authority to use the Army and the Navy of the United States to supervise elections in foreign countries, then the committee is hereby directed to report to the Senate, by bill or otherwise, the necessary legislation that will prevent such illegal use of the armed forces of the United States in the future.

4. If the President of the United States has authority, under existing law, to use the Army and the Navy of the United States to supervise an election in Nicaragua, has he not the same authority to use the same forces in the supervision of an election in any other foreign country?

5. Will the use of the Army and the Navy of the United States in supervising elections in foreign countries have a tendency to bring on war between our Government and foreign nations where such supervisory authority is attempted?

6. If the President of the United States, under existing law, has authority to use the Army and the Navy to supervise elections in foreign countries, does he possess the same authority to use the armed forces of the United States to supervise elections in different States of the Union and would such use of the Army and the Navy of the United States be advisable in cases where the Senate has official information of corruption taking place in State elections where members of the Senate and House of Representatives are elected?

SIXTH PAN AMERICAN CONFERENCE

Mr. SHIPSTEAD submitted the following resolution (S. Res. 165), which was read and referred to the Committee on Foreign Relations:

Resolved, That the President be, and he is hereby, requested, if not incompatible with the public interest, to furnish the Senate at the earliest practicable date with the detailed report of the United States Delegation to the Sixth Pan American Conference, together with the texts, both in English and in the language of origin, of all committee reports, treaty drafts, and resolutions adopted or proposed in that meeting.

INTERSTATE COMMERCE COMMISSIONERS

Mr. SACKETT obtained the floor.

Mr. NEELY. Mr. President, will the Senator yield?

The VICE PRESIDENT. Does the Senator from Kentucky yield to the Senator from West Virginia?

Mr. SACKETT. I yield.

Mr. NEELY. Mr. President, the attention of the Senate and the country is invited to the following news item, which appeared in yesterday's Evening Star:

INTERSTATE COMMERCE COMMISSION RESIGNATIONS REPORTED LIKELY—SENATE'S FAILURE TO CONFIRM COMMISSIONER ESCH STIRS RESENTMENT

Resignation of "two or three" members of the Interstate Commerce Commission as a result of failure of confirmation by the Senate of Commissioner John J. Esch was freely predicted to-day in political circles. At least one member of the commission is known to have declared within an hour after the Senate Interstate Committee had acted unfavorably on Mr. Esch's renomination that he and the other 10 members of the commission should resign in a body in protest against what is declared the unfair attitude of the Senate.

Nevertheless, it was declared on high authority at the commission to-day that resentment against the Senate for its declared unfair action is spreading among members of the commission and that several resignations among its membership may be looked for shortly.

Mr. Esch's vote in the coal-rate case coincided with those of the majority members of the commission, and other members were represented to feel that their integrity as well as that of their unconfirmed associate had been attacked by the negative vote of the Senate committee.

Mr. CARAWAY. Mr. President, may I ask the Senator a question?

Mr. NEELY. Certainly.

Mr. CARAWAY. Does the Senator feel that the commissioners really do intend to resign or that they are just extending a hope to the country which will be disappointed?

Mr. NEELY. In my opinion they do not intend to resign, Mr. President, the Star's sponsorship of a news item is ordinarily accepted as adequate proof that the item is true. But in spite of the fact that it impliedly vouches the verity of the article that I have read, I am nevertheless unable to believe that this news item correctly represents the attitude of the Interstate Commerce Commission. It is impossible for me to believe that the members of the commission would for an instant attempt, or think of attempting, to intimidate or coerce the Senate into pusillanimously surrendering its lawful right and violating its lawful duty to determine the qualifications of appointees to membership on the commission.

If this newspaper article be justified by the facts in the case, it discloses the most extraordinary and reprehensible attempt in the history of the Government to intimidate the United States Senate.

Mr. CARAWAY. And the most ineffective.

Mr. NEELY. Manifestly so. I hope that the commission will promptly inform the Senate whether the article in question correctly states the attitude and the intentions of the members of the commission in the matter of the pending Esch confirmation.

Mr. HEFLIN. Now, Mr. President, will the Senator yield to me merely for a moment?

The VICE PRESIDENT. The Senator from Kentucky [Mr. SACKETT] has the floor.

Mr. HEFLIN. Then will the Senator from Kentucky allow me to ask the Senator from West Virginia one question at this time?

The VICE PRESIDENT. Does the Senator from Kentucky yield to the Senator from Alabama?

Mr. SACKETT. I yield.

Mr. HEFLIN. Suppose the Senator from West Virginia [Mr. NEELY] shall make the inquiry which he suggests, and shall find out that the members of the Interstate Commerce Commission have given expression to such sentiments. Then we can confer with them, and I should be in favor, if they have given expression to such sentiments, of letting them know that we will accept their resignations.

MUSCLE SHOALS

The Senate, as in Committee of the Whole, resumed the consideration of the joint resolution (S. J. Res. 46) providing for the completion of Dam No. 2 and the steam plant at nitrate plant No. 2 in the vicinity of Muscle Shoals for the manufacture and distribution of fertilizer, and for other purposes.

Mr. SACKETT. Mr. President——

Mr. BLACK. Mr. President, will the Senator from Kentucky yield to me for the purpose of offering a comparatively

short amendment to the pending joint resolution? I desire that it may be read, as the Senator may wish to discuss it in connection with his speech.

Mr. SACKETT. I yield to the Senator from Alabama for that purpose.

The VICE PRESIDENT. The amendment proposed by the junior Senator from Alabama will be read.

The LEGISLATIVE CLERK. Amend section 10, page 5, line 19, by substituting for the figures "$2,000,000" the figures "$35,000,000." Amend section 8, by substituting for it the following:

The farmers' board herein provided shall immediately provide for the completion of such phosphoric acid plants at Muscle Shoals and other equipments as may be necessary for the manufacture of fertilizer by the most improved available process in commercial and salable form, and shall provide equipment sufficient to manufacture an amount of fertilizer containing 50,000 tons of nitrogen, using nitrate plants No. 1 and No. 2, if they deem it advisable.

It is hereby again expressed to be the fixed policy of this Government to utilize the power at Muscle Shoals for the farmers of America in the manufacture of fertilizer. There shall be turned over to such farmers' board immediately after the passage of this act nitrate plants No. 1 and No. 2, and the steam plant connected therewith, Dam No. 2, and the power therefrom, and all dwellings, houses, buildings, shops, and other equipment at Muscle Shoals necessary for use in the manufacture of fertilizer; Waco Quarry, with the houses and equipment there, and the said farmers' board shall not sell any power so as to prevent or restrict the full use of same in the manufacture of fertilizer. If there should be any surplus power at any time, more than is needed for the manufacture of fertilizer, the farmers' board may sell it to States, counties, municipalities, corporations, or partnerships, or individuals, but preference shall be given to States, counties, or municipalities, purchasing said current for distribution to citizens and customers. Any contract made for the sale of power shall contain a provision that the same may be canceled by the farmers' board whenever they are of the opinion that the power is needed for the manufacture of fertilizer, or for the manufacture of any by-products, when such manufacture would reduce the manufacturing cost of fertilizer. The proceeds received from the sale of power shall be retained by the farmers' board for use by them in the manufacture of fertilizer as herein provided.

Amend by adding section 12:

"SEC. 12. A board shall be appointed by the President immediately after the passage of this act, consisting of five members, who shall be appointed as follows: The President shall select one from a list of nominees suggested by the American Farm Bureau Federation; one from a list of nominees suggested by the National Grange; one from a list of nominees suggested by the Farmers' Educational and Cooperative Union of America; and the President shall further designate one member to represent the Department of Agriculture and one to represent the Department of War. The members selected from the farm organizations shall receive a compensation of $7,500 per year and shall devote their entire time to the administration of their duties as members of the board. The board shall have the authority to prescribe its own rules and regulations for the administration of its business, and it is hereby declared to be the object of the creation of this board to provide for the manufacture, sale, and distribution of fertilizer, directly to the farmers and farm organizations of America, in the most concentrated form practical."

Amend further by substituting for the words: "Secretary of Agriculture" and "Secretary of War" wherever used in the original resolution, the words: "Farmers' board," as herein created.

Amend further by striking from the original resolution subdivision (b), pages 3 and 4, of section 6.

Amend section 7, on line 17, page 4, by substituting for the words "Secretary of the Treasury" the words "farmers' board," as herein provided.

Mr. SACKETT. Mr. President, I wish to address the Senate for a few moments upon the Muscle Shoals problem. I shall do so because I have had the opportunity of studying the question to a considerable extent as a member of the special committee which this body appointed two years ago. From the experience that I have had with the whole subject, I find that the information of Members of the Senate as to the problem that is presented by the pending joint resolution and by the various proposed substitutes is not complete but is fragmentary. Furthermore, because we have here a technical problem that requires very considerable study by any Member of the Senate before he can vote on it intelligently.

It will be necessary for me, in the short discussion that I shall make, to differ from the joint resolution offered by the Senator from Nebraska in one part; it will be necessary for me to suggest slight amendments to another part; but I want to say to the Senate that, though I shall have to take a position which will not meet the views of some of its Members, I do not feel that I or any other Senator who is trying to reach a just and real determination of this great question before the country ought to be subjected to any aspersions as to his motives in so doing.

The Senator from Nebraska [Mr. NORRIS] has introduced a joint resolution which calls for the Government operation of the power plant. I can not agree to that for reasons which I hope to state to the Senate. If those reasons shall commend themselves to the judgment of the Senate, if they shall involve the presentation of valuable facts to the Senate, I hope that my expression will be taken as the honest opinion of one who seeks to bring about a proper solution and that credence will not be given to the idea that I am interested in any particular developments in this country other than to bring those developments to such a fruition as will be for the best interests of the people.

I wish to speak first in regard to the second part of the joint resolution which has to do with the production of fertilizer. I believe that is the real meat of the subject. We have not only the so-called Norris joint resolution pending before us, but we have some 10 or 15 amendments and proposed substitutes that have been submitted in good faith by different Senators to meet their personal ideas of how this problem should be handled. Some of them are based upon the desire to have the fertilizer which is to be produced made in a certain section; others are based upon a desire to have the fertilizer made by a certain process; but I think that every one of those suggestions is made in the absolute hope that fertilizer will be provided at a price at which it can be used on the farms of this country.

We have been listening during the last week to hopes for the production of fertilizer, that have come almost entirely from the South. It is a mistake to consider that the need of fertilizer of a concentrated type at a very low price is limited to the South or to the cotton fields. If such fertilizer could be used generally upon the cotton fields there would result a very decided increase in the production of cotton per acre, but the increase which would come in the yield of cotton would not be so great in proportion as would the increase in the yield of the wheat fields if we could obtain fertilizer sufficiently cheap to be used there. It would not be so great in proportion as the increased yield that would come on the widespread cornfields of this country, if we could secure the fertilizer cheaply enough to be used on those fields. It is my hope, and I think the hope of those who have been working constantly upon the idea of a concentrated fertilizer, that the price of the material in a completed form can be so reduced in the not far distant future as to bring it within the realm of probability that it can be used on practically every farm in the United States.

That statement may seem somewhat unusual; but industrial chemistry in this country has been making tremendous strides. All of us who have been engaged in the general business of the country can not fail to recognize the enormous advantages that have come from the development of industrial chemistry in almost every branch of business; and yet it seems to me that industrial chemistry as applied to fertilizer manufacture today is almost in its infancy.

The fertilizers we have used have been fertilizer mixtures; not, in a true sense, chemical fertilizers. They have carried to the field, as everybody knows, a very small proportion of the actual food of the plant. Because of the few points of manufacture they have involved, as has been shown, large freight charges. They have required tremendous charges after they reach the farm in order to have them spread, since it is necessary to spread so much waste material. The use of concentrated chemical fertilizer simply means taking the few plant-food elements that come in nature, concentrating them into a narrow compass, combining them according to the needs of the particular land, and shipping them with a large proportion of the actual plant food to the bulk of material which is shipped.

When you get the concentrated chemical fertilizer to the farm it takes far less wagons to carry it out on the fields and much less labor to spread it; and if that fertilizer, concentrated and chemical in form, can be manufactured in every crossroads and hamlet of this country, it will make it available to the farms of the Nation as a whole without these excessive freight charges which make it so expensive to-day to use it, considered even with the tremendous influence it has on the production of the fields.

I talked to the Senate a year ago on this subject, and brought out at that time that new investigations had just then been published, practically within a month, which showed the results of actual experiments as to what concentrated fertilizer would do upon the different crops and upon the fields. I almost hesitated to tell the Senate the result of those experiments, because the increase of production was so tremendous.

In corn and wheat, as I recollect, the concentrated fertilizer doubled the production of an acre. In cotton it increased it by more than a half. If that can be done at a cost that will make it pay it reduces your farm overhead, it requires much less land in order to get the same results, it saves in labor, it saves in every element that goes into farm costs, and it will be a tremendous benefit to the people who live upon the land and who need it more than any other people that we have in this country to-day.

As I say, we are not a unit in the Senate, because we do not quite understand the technicalities of the various types of fertilizer and the various processes by which it is made. While we have a good many amateur chemists in the Senate who are willing to tell us forthwith that this will do one thing and that will do another, I do not believe there is any safety in that smattering of knowledge which we as nontechnical men may have. I believe that the only way we can approach a solution of this question is to take the consensus of the chemists of this country as to what is taking place, irrespective of the technical methods by which it is done, and pin our faith to the men who have been educated in these particular lines.

I listened with a great deal of interest to the speech which the Senator from Nebraska [Mr. NORRIS] made upon this concentrated fertilizer. I can say, as a result of sitting for months upon the special committee, that he has thoroughly grasped the situation of the fertilizer industry. He may not be technically expert in how to make a mixture, but he has followed the trend of the industry from the time we first knew about taking nitrogen from the air, and he showed without a shadow of a doubt that the trend of the industry to-day is toward the synthetic processes. I do not find a single opinion from technical men—and I have searched—that does not tell us that in the future nitrogen from the air will be synthetically produced by the gasification of coal. I do not find it, I say, from any technical men except from those who have some connection with the other processes that are in use to-day, and who are not yet willing to acknowledge the leadership of the new processes which come from the synthetic methods. I do find that a great cheapening of cost has already been accomplished in the synthetic methods.

There is another feature to this whole fertilizer problem to be considered in the disposition of Muscle Shoals.

In order to make a successful plant food you have to combine three elements. We talk here in the Senate only about taking nitrogen from the air. Nitrogen is only about 25 or 30 per cent of the total requirements of a plant food that will make the farms produce these tremendous quantities. You have to combine that with a phosphoric acid. That is a different material from the ordinary acid phosphate of the trade to-day. As nearly as I can find out, the scientists believe that the production of phosphoric acid to-day is very much more expensive than it need be if we can experiment and study new methods of production for phosphoric acid. The experts that I have read after tell me—and I do not set up my own opinion at all, because I think we must follow the men who have been educated in those lines—that the excessive cost of phosphatic acid to-day comes from the fact that it has not been needed heretofore in great quantities, and the need of cheap production has not been pressing upon industry; that the cost of production of phosphoric acid to-day warrants the assumption that by competent study and experiment it can be reduced materially, and it forms a large portion of the cost of concentrated fertilizer.

The third element that you have to have in quantity, in making a successful fertilizer, is potash.

Most of our potash comes from Europe; but last year we provided the opportunity of trying to find potash in what were thought to be the fields of Texas and New Mexico. The Government is going down into those fields and sinking core drills, bringing up the core, and analyzing the product, to see if we can find potash. They have dug already seven wells. They have others going down. They drill one at a time. They have found beds of potash. They have not yet found much potash in the chloride form. They have found it in other forms. They would prefer the chloride form, because it could be extracted more cheaply. There are private potash companies now in those fields which are doing some work not connected with the Government, and they are having considerable success in finding the chloride form. The latest information I could get from the Bureau of Mines on yesterday was to the effect that they thought the experiments so far warranted great hopes of our being free from the need of getting foreign potash for any fertilizer that we seek to make in this country.

Therefore, these three elements are concerned in this thing.

The fertilizer business, Mr. President, if the product could be brought to a cost that would enable it to be used generally, would become one of the biggest industries in America, because the necessity of its use is so universal. Therefore in dealing with this whole question you are dealing with one of the future great businesses of America if you can produce cheaply.

You are not dealing merely with the question of the disposition of a power plant at Muscle Shoals. You are dealing with something that will go to every farm in America if it can be done. You are dealing with what will be the leading business experiment of this country, and I want you to realize that in what you may do this week on this joint resolution you are committing this country to a development that will be worth more to it than almost any other matter that can come before the Senate.

Muscle Shoals itself is just one big water power. The thing that you can do with Muscle Shoals, if you will, is to use Muscle Shoals to make possible this concentrated fertilizer so that it will benefit the Nation as a whole. You can do it under the theory that the Senator from Nebraska has set out in principle in his joint resolution—that is, that though the times have changed since we went into Muscle Shoals, though we no longer are able to make economical fertilizer by the use of tremendous amounts of electric power—yet we can use that power to raise the funds that, if rightly applied, can bring about this thing which ought to be desired by every Member of the Senate—that is, the production of a fertilizer for such general use, and which can be manufactured in such a large number of places—that it will be a benefit in every section of the country.

I do not see any reason why any Member of the Senate who sat through the hearings that were had last year, and who took occasion to read the technical pamphlets that have been issued, should for one moment feel that he could advocate the production of nitrogen by any method except a synthetic method. I give you that as the deliberate judgment as one who has read, not as a technician, and has simply applied common sense to what we are told by others in whom we have confidence who have studied this question more deeply than we have.

I happen to have at hand the remarks made by Doctor Howe in a recent address. He is a chemist, the publisher of the magazine Industrial Chemistry. I read just a sentence:

> It has been abundantly demonstrated in all parts of the world that, other considerations being comparable, the erection of a plant to fix nitrogen to-day is based wholly upon the synthetic ammonia process.

Senators, we are not going to get men who know the business, who have studied it for years, and who occupy places of prominence in the industrial world to make clean-cut statements like that on a technical matter unless they know they are going to be backed up by the results.

Mr. FLETCHER. Mr. President, will the Senator allow an interruption?

Mr. SACKETT. Certainly.

Mr. FLETCHER. Was not nitrate plant No. 1 at Muscle Shoals constructed on that basis and principle?

Mr. SACKETT. Nitrate plant No. 1 at Muscle Shoals was constructed on the idea of using a large amount of power to produce nitrogen, but what I refer to as the synthetic method is through the gasification of coal.

Mr. FLETCHER. Nitrate plant No. 1 uses coal, as I understand it.

Mr. NORRIS. Mr. President, if I may be pardoned, one Senator is referring to one nitrate plant and the other is referring to the other one.

Mr. FLETCHER. I am referring to nitrate plant No. 1.

Mr. NORRIS. Nitrate plant No. 2 is the plant to which the Senator from Kentucky has referred, but nitrate plant No. 1, which was constructed at the same time, is the one to which the Senator from Florida refers. Nitrate plant No. 1 was constructed during the war, when we did not have in this country a single plant anywhere operating under the synthetic process, or what was then called the Haber process. It was known that Germany was doing it, but we did not know how. Nitrate plant No. 1 was built, and it was developed that it was a complete failure so far as getting any nitrogen was concerned.

Mr. SACKETT. It is the synthetic method, but it is not the method of gasification of coal. When using technical terms, I will say to the Senator from Florida, it is almost necessary, when we argue a question, to have a dictionary showing the exact meaning of every word we use. That is what the chemists have, and that is the advantage they have; and that is the difficulty we have in the open Senate. We can not always be sure we are using the words with the correct meaning.

"Synthetic" is a wide term; but a synthetic method that is dependent upon the gasification of coal for its product is a more defined and limited term, and that is the term I am trying to use here to-day.

Mr. KING. Mr. President, will the Senator suffer an interruption?

Mr. SACKETT. I yield.

Mr. KING. Does the Senator mean to state that in the cyanamide process coke may not be used for the purpose of eliminating the calcium and of uniting with the nitrogen other elements in compounds such as are introduced by the synthetic process? Indeed, the cyanamide process, if the word "synthesis" is employed in its ordinary and perhaps technical and scientific meaning, is a synthetic process, or cyanamide is produced by a synthetic process.

Mr. SACKETT. That may be true. I am not trying to argue the relative values of these different processes, because, as I said in the beginning, I think the most we amateur chemists of the Senate can do is to be guided and led by the men who have made those matters life studies, and not to attempt to set up our little knowledge of what industrial chemistry is performing to-day. In the statements of those men, almost without contradiction, they refer to the growing developments that are taking place in the use of coal as a base, through its gasification, to bring about cheaper production of nitrogen from the air.

I could read again from Doctor Howe, where he tells the amounts of production and all that, and gives the basis on which he makes the final statement which I did read, that every tendency to-day is toward a synthetic process, through the gasification of coal; that is, if we are really seeking nitrogen from the air.

Chemistry is a wonderful thing. As I said before, it is in its infancy. It is going to be subject to just as great changes in the next few years as it has been subject to in the last few. Experiments are being carried on all over the world to-day. We are going to see some new results, which may make the present process not the cheapest process, which may make it so obsolete, almost by the turn of a wheel, that we will have to abandon it and go to the newer development.

Any man who undertakes to say that chemical processes in the manufacture of any product to-day are in their final stage, or in the most useful and economic stage, does not know the history of business in America. He could not have the temerity to fix a definite method or a definite process of manufacture unless he were unwilling to yield to industrial chemistry the leadership which it has demonstrated year after year, and which we may look forward to for years to come.

To the resolution of the Senator from Nebraska I have offered certain amendments, through the Senator from Rhode Island [Mr. METCALF]. I say I have offered them, because I suggested them to him. I did so because I have offered a substitute for the whole resolution myself, and did not want to complicate it. I felt there were amendments to other parts of his resolution pending which, if adopted, would make it a more suitable measure, but I feel that these suggestions as to fertilizer production ought to be included.

One of those amendments provides for a larger sum of money to be appropriated for the purpose of building the necessary plants for the production of nitrogen from the air, and of phosphoric acid, because I recognize that in the progress of industrial chemistry a plant may be built to-day, and two years from now it may be out of date and money must be secured to put up a new and different plant.

Mr. NORRIS. Mr. President, will the Senator yield?

Mr. SACKETT. I yield.

Mr. NORRIS. I rise not for the purpose of finding fault with the statement the Senator has just made but to explain to him, if I may, the reason for the authorization of the appropriation contained in my resolution.

As the committee reported the measure last year it contained an authorization of $10,000,000. In the pending resolution the authorization is for $2,000,000. It was cut down after consultation with Doctor Cottrell, who himself suggested the amount to the committee, and we thought that that would be all that would be necessary. I am not finding fault with the Senator——

Mr. SACKETT. I appreciate the Senator's interruption.

Mr. NORRIS. The Senator has just called attention to a condition, and if we want to be economical and not throw away money extravagantly we can pretty near demonstrate, it seems to me, that a very large appropriation is unnecessary, that we could take $10,000,000 at the outside—I think some have said eight—and build a plant down at Muscle Shoals to be operated under the synthetic process that would have a capacity of 40,000 tons of nitrate a year. I would not have serious objection to doing that very thing; but as a business man it seems to me in the present state of the chemical propositions involved, which the Senator has so accurately outlined, it would be unwise to build a plant larger than was necessary to perform the necessary experiments, for fear that, as the Senator has said, to-morrow we would find that we had improved the system so that a lot of our expenditure of money would be useless, and until we have the manufacture of this article perfected it seems to me it would not be good business policy to proceed on such a large scale. We ought to proceed on a large-enough scale, regardless of how much it may take, so that the experiments may be performed in a commercial way, in a large way, as distinguished from a laboratory test.

If some of the amendments proposed to this resolution, to some of which I have no serious objection, should be adopted, I anticipate that it will be necessary to increase the authorization from $2,000,000 to a larger sum.

Mr. SACKETT. I appreciate the Senator's suggestions, but my suggestion was made for a little different purpose. In the first place, I think this thing is going so rapidly that the plant may become obsolete almost between sessions. It may be that a further plant will be necessary. I think the work to be done on phosphoric acid has not been considered, or the work of the nitrogen laboratory that we have here in Washington; that is, the cost of plants that must be built to develop phosphoric acid in its cheap form has not been sufficiently considered.

More than that, I think we have to produce this fertilizer in quantity, and I think the Government can afford to do it, in view of the great benefits which the production of this fertilizer in quantity would bring to the farmers. I think, furthermore, that if it is to be produced in quantity there must be developed a use for the article.

This fertilizer is being made in Germany; it is being made in France; and it is being made in Italy, and the great difficulty they find there is the unwillingness of the farmers to use it. A sales resistance, which an innovation in husbandry always meets with, is one of the most difficult things to overcome. Therefore, I feel that on account of its great need, on account of the probable cost, and the fact that there will be new development in the manufacture of the various articles, it is going to be necessary to produce it in quantity, and to begin a large-scale production in order to begin the work of introduction and save time in its eventual general use.

Mr. KING. Mr. President——

The PRESIDING OFFICER (Mr. HARRIS in the chair). Does the Senator from Kentucky yield to the Senator from Utah?

Mr. SACKETT. I yield.

Mr. KING. I do not wish to misinterpret the position of the Senator, but as I understand his position it is that the United States need fertilizers, but we can not trust private capital to produce the same at Muscle Shoals, notwithstanding the fact that private capital has built a large number of fertilizer plants, and has produced and is now producing a considerable part of the fertilizers used by the farmers of our country. As I am advised, there are corporations, not governmental, operating plants, some using the Haber process, others the synthetic and the cyanamide processes. These various plants are making hundreds of thousands of tons of fertilizers annually. The fact is, I repeat, that private capital has been invested and large sums are now being employed in producing nitrogen and other components important in making suitable fertilizers. But, as I understand, the Senator contends that we can not trust private capital to provide nitrogen and the basic elements required in making proper fertilizers needed in the United States, and therefore the Government must go into the business. Is that the Senator's position?

Mr. SACKETT. That is not the position I take. I think the Senator readily recognizes the fact that I would not want to say to anybody that I would not trust private capital to do anything. I think the ingenuity of American business men has demonstrated that they can do anything in every line of endeavor in this country.

Mr. KING. I agree with the Senator.

Mr. SACKETT. If it is profitable, if it is a thing that can be worked out, the American business man does not wait for the United States Senate to talk 10 years on Muscle Shoals before he goes ahead. But the American business man has waited 10 years for the Senate of the United States to go ahead, and because he has run up against tremendous expenses, both in production and in distribution, which he has been hesitant to incur, because he knows what the development of the processes must cost and what obsolescence of plant must cost, and the difficulties that lie before him there, and he looks askance at wholesale manufacture when he considers the sales resistance he is necessarily going to meet upon the farm. We are overcoming it gradually. We have a plant in Hopewell now under way which I am told, though I know nothing about it, is going into a large production of synthetic nitrogen by a certain process which they have in control.

What I am seeking is to make the processes available at every crossroads of the country, in order that cheap distribution may be had. As a man opposed to every interference with private work in industry, I believe that the situation here has developed to the point where, on account of the rapid changes which are taking place, the Government alone can afford to go into the field as an experiment and waste the money if necessary. What would be the wasture of $10,000,000 if we could double the production of a crop upon the farm? It may be necessary to waste a certain amount of money in developing a process, but the goal which is hung before us for this thing must appeal to anybody that has an interest or a stake in the country. When we think of the difficulty of getting distribution we must come to the conclusion that we will have to have the benefit of our Department of Agriculture, which has the confidence of our farming community, to bring about its use through experimental farms, to guarantee the farmer against loss. There is a prejudice against anything that is denominated "concentrate" when it comes to be put upon the tender blades that grow upon the field.

Mr. NORRIS. Mr. President, will the Senator permit an interruption there?

Mr. SACKETT. Certainly.

Mr. NORRIS. The reference the Senator has made in answer to the Senator from Utah calls to my mind, right along the line which he was talking, a conversation which I had with Doctor Cottrell on this very subject. It is the reason for the inclusion, in the resolution which the committee has reported, of some of its provisions. The Senator just told of the need for Government help in making these experiments and trying to get a concentrated fertilizer, which is the ideal for which we are all striving and for which scientific men have been striving for years, calling attention to the great danger involved in financial loss of anyone who wants to improve the system. It backs up the Senator in his statement that there is about only one place on earth to go and expect favorable consideration, and that is the Government; that for the benefit of all the people the Government can afford to make the experiment which may result in a loss.

The idea of Doctor Cottrell was, for instance, and it is in the resolution, something like this: Suppose he developed a concentrated fertilizer as they can now make it, the question then comes of its application to the soil and getting it in such form that he thinks it will work. Who will try it? The Government does not own the farms. The Government would not try it. The Government can not go out to a farmer and say, "We are going to try a new fertilizer on your crops this year, on 160 acres of your land," because the farmer does not know whether it may kill all his crop or not. It might be an absolute failure. We have to expect those failures. So he is given authority to contract with the farmer, if he will let him experiment on a large enough scale to demonstrate that commercial men can apply it in a business way, and in case it is a failure he pays the farmer for the loss of his crop and for the use of his land.

It is hardly fair to expect private individuals in business to do that. If they did, they would be charging a fabulous price for their fertilizer in order to make up the losses which they would necessarily sustain in those experiments. Therefore, it seems to me, as the Senator has said, that it well comes back to the proposition that when we are going to apply any new method of fertilization on a large enough scale to know whether it is going to become of practical use, the Government is about the only institution that can afford to do it. If a private party does it, he is going to charge enough to get it back, and he ought to. He may fail, and because there is danger of his failing, if he is getting along all right, he sticks in the old rut and does not perform the experiment. He says, "They will buy what I have. It is not all that it ought to be," but he goes on.

So it seems to me the way to get an improved fertilizer is for the Government to go into the business on a sufficiently large scale, and, if it develops something new, then it does not patent it like the private party would. It is open to the world and the fertilizer manufacturer can utilize it the next day and eventually, if we accomplish what we think we can or hope to do, it will be private institutions and private corporations, which are in the business for what they can get out of it, that will eventually be supplying the fertilizer to the farmers of America, but they will have had the benefit of governmental experiments on a large enough scale to know whether they can carry the idea out for practical purposes.

Mr. KING. Mr. President, will the Senator from Kentucky permit a rather extended interruption by way of reply to the Senator from Nebraska?

Mr. SACKETT. Certainly.

Mr. KING. The argument just made by the Senator from Nebraska is the one usually employed by paternalists, and I do not mean by that to say that the Senator from Nebraska is a paternalist. It is always advanced by those who want to project the Government into business. It rests upon the assumption that the American people lack the ability, the genius, the inventive characteristics, the technical as well as the practical knowledge, the chemical skill, to undertake new enterprises or to enter new fields for the development of the arts or sciences or industry. The argument is that the Government must construct fertilizer and chemical plants and produce fertilizers, and then sell or distribute the same to the farmers. The fact is that we lead the world in invention, in industry, in the application of the discoveries of science to the needs of the people. Americans, during the past 100 years, have secured more patents and produced or made more inventions than all of the rest of the world put together.

The field of discovery and invention has not been narrow, nor have the inventions and discoveries been limited to a few industries or confined to any particular section of our country. American genius has penetrated every field of science, and utilized in a practical way and for the benefit of the people, its intellectual and scientific achievements. There has been remarkable development in the dye industry. And in the chemical and pharmaceutical field, the United States ranks with any country in the world. Notwithstanding the great research work done by Germany and the high standards set by her scientific men, I think it may be said that the United States has produced chemists and scientists and technical men who equal, if they do not surpass in some fields, those of Germany or any other country. I do not make this statement for the purpose of boasting, but to pay deserved tribute in a feeble and defective way to the remarkable and extraordinary work performed by American scientists and chemists and those engaged in what is called research work.

And the business men of the United States have exhibited great interest in advancing science, in promoting inventions and discoveries, and in applying the same in a practical and utilitarian way to the development and advantage of our country. Our universities have exhibited increasing interest in applied science, as well as in pure science. It is a fact that the great leaders of art and industry from other countries visit the United States and return to their homes amazed at the extraordinary development of industry in the United States.

We have the greatest and most efficient smelters in the world, and in metallury, in the reduction of ores no country approaches the United States. A few years ago many base ores were regarded as valueless; to-day, by reason of the scientific advancement in mining and in metallurgy, these ores and other minerals are yielding profits to those engaged in their reduction.

Private capital has been available for these enterprises that have wrought such mighty changes in our economic and industrial life. The Government has not secured these great results, but American enterprise and genius and courage have made this the most powerful nation of the world.

It was not the design of the founders of this Republic that it should be a business machine or a paternalistic or socialistic government. Those who laid the foundation of States, as well as the Federal Government, were determined to be free from bureaucratic and paternalistic inefficiency and tyranny. They believed that the genius and quality of the American people would develop the highest form of political institutions and an economic and industrial system which would yield the most beneficent results. Their views have been vindicated and our development in art, in science, in mechanics, in utilitarian activities has been the most remarkable phenomenon exhibited in the life of any country.

The Senator from Nebraska referred to plant No. 1 at Muscle Shoals. It was built by the Government at a cost of $13,000,000, for the production of synthetic nitrogen, but was a failure under Government operations. Approximately $5,000,000 has been expended in addition for experimental purposes without any satisfactory results, and the plant is now idle and deteriorating.

Mr. SACKETT. The Senator must remember that that plant was built for war purposes.

Mr. KING. Oh, yes.

Mr. NORRIS. Now, if the Senator will permit me, plant No. 1 was a failure. I am not contradicting anything that I believe to be true. I always said it was a failure, and all the scientific men admit it was a failure. Yet, I think if the Senator would ask the chemists of the United States whether they think the Government was justified in that experiment, they would come back with a unanimous chorus that the Government was so justified. The Government spent several million dollars in the construction of nitrate plant No. 1. Where was the private corporation, where was the private individual that was

willing to do that? Not a cent was any of them ready to invest. The Government spent over $50,000,000 of Government money in the construction of nitrate plant No. 2. Why did not private initiative do it? Why did they ask the Government to do it?

Mr. SACKETT. Confirming what the Senator has said about plant No. 1, may I quote again from Doctor Howe?—

It is also history that the No. 1 plant, erected as an experiment, produced fixed nitrogen only experimentally, but that it served a useful purpose as a pioneer interest in this enterprise in this country, paving the way for a synthetic ammonia industry which in my opinion has to-day rendered Muscle Shoals plant obsolete, whether considered from the standpoint of nitrogen for defense or nitrogen for the use of agriculture.

Mr. NORRIS. Mr. President——

Mr. KING. I had not finished my reply to the Senator from Nebraska.

Mr. NORRIS. I have to take the Senator's criticism in sections, because it is so lengthy that I am apt to forget it.

Mr. KING. But the Senator made such an able speech.

Mr. NORRIS. I do not mean to trespass upon either the Senate or the Senator from Kentucky, who so kindly yielded to me. I was getting to the point that the Senator has illustrated by his quotation from Doctor Howe.

Nitrate plant No. 1 was a failure. Nobody else would build it, and yet by the experiments we made, the mistakes we made, when they came to apply it, it resulted, as everybody admits, to a great extent in the present wonderful knowledge that the chemical world has, particularly in the United States, of the synthetic process. Following that failure by the Government, profiting by the experiments the Government made, there was a private company which constructed a synthetic process at Syracuse. It has been successful ever since, though not nearly so successful as later ones. Following that came others in different parts of America. There came one at Charleston, and now we have one at Hopewell, the largest in the world, I am informed, which has reduced the cost still more. To a great extent the men who are doing that owe the development to the experiments made by the Government of the United States when nobody else would make them.

Mr. KING. Mr. President, may I trespass upon the Senator from Kentucky?

Mr. SACKETT. I yield.

Mr. KING. The Senator from Nebraska bases his argument upon the theory that unless every need of the people is immediately satisfied then the Government must undertake the task of satisfying such need. His idea seems to be that whenever any wish is expressed, in some magical way factories will be erected, enterprises set on foot, and material results affected. He would have everything which the people desire spring immediately from the brow of Jove. If smelters are needed to treat refractory ores, and private capital hesitates, then the Government must undertake the erection of smelters for the purpose of extracting the values from such ores. If dyes and chemicals are required by the people, they must be immediately provided by the Government, if private capital does not at once provide them for the people. There must be no evolution, everything must be spontaneously produced, or the Government must undertake its production.

Mr. President, the great achievements which have made for the benefit of mankind have been the result of private and individual efforts and labor. Governments have different functions to perform than individuals. The great inventors and scientists have wrought out their great work without governmental aid and often amid hardships and sufferings that challenged the stoutest heart.

The United States is a young nation, and yet its progress in a material way in the application of inventions and discoveries, in the mechanical arts, and in every field of human endeavor, has been such as to challenge the admiration of the world. Capital is available whenever the imperative needs of the people require it. It would be undesirable and quite unnecessary to gratify every human want and desire instantly or in a very limited period of time. Our railroads were not built in a day; our waterways and harbors will not reach the full standard of their development for many years. The results of our technical knowledge and our inventions and scientific discoveries will not be realized in their fullness in this generation, and perhaps not in this century. We are not to have everything in our own day. There are new fields to conquer intellectually and in the industrial and economic field.

We are not Alexander, weeping for new fields to conquer. And it is fortunate for us that such is the case. Our progress would be arrested if there were no discoveries to be made, no more mountain peaks of knowledge to be ascended, no more enterprises to be embarked upon, no more factories to be built and industries to be developed.

American business men and American capital will give to the American people whatever they should have; they do not need contributions from the Federal Treasury to accomplish that result. Fertilizers will be produced in abundance and to meet the requirements of the farmers, not perhaps in a day or a year, but in due season. And its production will be brought about more rapidly by private enterprise than by governmental operation. Paternalism has not proven to be a satisfactory or efficient organizer or producer. It has almost destroyed the industries of Russia and its heavy hand has arrested progress in many countries. A few years ago we produced but few of the dyes needed in our textile production. Germany did produce them, and both countries profited in the trade resulting from their purchase by Americans. The mines, the smelters, and the multitudinous business activities of our growing and expanding country promised greater awards to the investor and hence he did not build dye plants and manufacture dyes. But when there was a return upon the capital invested and when the situation in our country required the production of dyes and pharmaceuticals and medicines, capital was available, and hundreds of millions have been invested for that purpose.

Mr. President, whenever there is any great need for any product capital will be available without governmental intervention.

My friend complains because the farmers do not understand the use of concentrated fertilizers.

Mr. SACKETT. Not because they do not understand it, but because they are afraid of it.

Mr. KING. The Senator's position, if I understand it, is that the Government must not only go into the business of manufacturing fertilizer but it must distribute the same to the farmers, and then teach them how to use the same. In other words, the Government is to go into the manufacturing business upon a large scale and then provide selling agencies and distributing instrumentalities to reach all the farmers in every part of the United States. The Government is to conduct experiments, it must provide the capital for plants and buildings and factories, including warehouses and cars and all the necessary personnel for handling, selling, and distributing the products of its factories. But this is not sufficient. The Government must go to the farm and show the farmers how to use the fertilizers manufactured at Government plants. And, of course, if the Government engages in this enterprise, why not in others? If it manufacture fertilizers and distributes them to the people, why not dyes and chemicals and electric power? Where will the end be? What are the limitations upon the power and authority of the Federal Government?

Mr. President, aside from the question of authority there is the question of expediency, the question of economy. There is too much paternalism in our country now, there is too much legislation which projects the Government into activities and business enterprises which belong to the field of private endeavor. In my opinion, we will best serve the people by keeping the Government within its legitimate limits. The American people will rise to every emergency; they will provide for their needs; their genius will develop new industries, promote new enterprises, effect changes and modifications in our economic and industrial system. American capital will be ready to build where building is needed, to launch new enterprises where they will be of advantage to the people, and to satisfy all legitimate aspirations and wants in every part of our country. If we introduce paternalism with its deadly paralyzing inefficiency, we will arrest our industrial progress and mar the industrial and political system which the genius and patriotism of the American people is producing.

Mr. SACKETT. Mr. President, if the Senator from Utah thinks I am a paternalist, God help the rest of them; that is all. We might just as well, under the Senator's argument, abolish the Department of Agriculture as to say that department shall not teach the farmers who need instruction the use of concentrated fertilizers. Why let the department teach the farmers any other soil work or any methods of husbandry or poultry raising or any of those things? But so much for the fertilizer part of it.

I wish to say, in passing, that the Senator from Nebraska [Mr. NORRIS] and I do not differ as to what the director of the nitrogen laboratory wants. He wants an experimental plant for the production of nitrogen. I do not want an experimental plant, because I think it is necessary to go into the business on a large scale, for the goal to be reached is so wonderful for the country as a whole. It is going to take so long to secure the use of the fertilizer throughout the land that the country

can better afford to go into it on a large scale, and, if necessary, lose a few obsolete plants, and the game is worth the candle.

Now as to the question of power. I think Muscle Shoals ought to be looked at from the point of view of its availability. We have 80,000 water horsepower there. Some of us call it kilowatts, some call it horsepower, and many of us do not know the difference; but in addition to the water power we have about 80,000 in the steam plant. It is located in the middle of the South, in what I believe to-day is the growing industrial area of the Nation.

I sympathize, and I sympathize strongly, with the desire of the Senator from Nebraska to lower electric rates for the people of the country, and I hope a reduction may be brought about; but he and I differ upon one fundamental, and that is that I feel, and I think that the evidence goes to prove, that the operation by the Government of the Muscle Shoals power plant and the selling of the current to municipalities that want it is not going to accomplish the result which the Senator from Nebraska pictures in such glowing terms and which he has found to follow from certain other municipal operations which have brought about lower rates from one cause or another.

The reason I state that is that if the Government operates Muscle Shoals it will control only the cost of production of electricity; that is all. It will control the cost of that electricity when it passes out of the station. That, in the trade, is called the "bus-bar" cost. As the evidence has shown without contradiction in the hearings that we have had, if we shall base the cost of electricity at the bus bar on the peace-time cost of building the dam and the steam plant, it runs around four-tenths of a cent a kilowatt; that is a little less than a half cent a kilowatt.

I know, and all Senators can check the figures, because they all have friends who can give them the definite information, that a modern steam plant located within easy transmission distance of Muscle Shoals can produce electricity at the bus-bar cost of not more than six-tenths of a cent a kilowatt. That is a little more than a half cent a kilowatt. The difference between the production cost of the Muscle Shoals plant and a modern steam plant in that same vicinity is one-fifth of a cent a kilowatt. If that one-fifth cent per kilowatt be translated to the bill which the small consumer, who is rightly held up here as the ultimate consumer, pays to the electric power company in his district—a bill that is variously estimated from 5 to 7 cents a kilowatt-hour—if that one-fifth of a cent per kilowatt be translated to his bill, one could never find it. The cost of electric power and light to the small consumer, wherever he may be located, is not the production cost of electricity—that is less than half a cent—it is the transmission charges, the overhead charges, and any other charges that accumulate and are computed by the electric power company after the electricity leaves the plant. The owning and operation by the Government of a producing plant can not affect those charges. The Government itself would have to take over the distribution, would have to meet the franchise requirement of the cities, would have to find some way to make those distribution charges cheaper than they are to-day before it could ever accomplish the desired result of lower bills to consumers of electricity in any part of the country. That is not any idle statement; that is not made for the purpose of argument; it is made in an effort to acquaint the Senate with a definite and pertinent fact as to why a great experiment in Government operation can not bring about the very desirable results that are hoped for. The costs of production by water power and by modern steam installations are so nearly together that the difference in spread can not yield advantage to any consumer so far as the size of the bill which he must pay is concerned.

I wish to say further—and it is very pertinent to this inquiry—that we are to-day just on the threshold of still greater economies in the generation of electricity by steam. It is difficult to conceive, and yet no one should have the temerity to prophesy it as a fact, that there can not be made a further reduction in the cost of electricity produced by water passing over the dam and over the wheel. Such a reduction is possible, but it is hardly likely; but to-day in the generation of electricity by steam in the modern plant we are adopting for the first time in history the use of powdered coal. Only last winter the Shipping Board fitted out one of its freighters with appliances to enable it to use powdered coal. That vessel was sent across the ocean and back again. It used high-grade coal from America on one side and low-grade coal from Germany on the other, the coal being in powdered form. The result was a very considerable economy on the first trip. So striking was the saving effected that the Shipping Board is requiring other vessels under its control to be fitted out with similar mechanism.

The boiler factories of this country are to-day constructing boilers for the first time in our history without a fire bed, but adapted for blowing the coal, finely ground, into the furnace, and doing all the work automatically. In an industrial plant to-day which has been adapted to the use of such boilers there will not be found laborers working around the boiler room. Gravity does the work of feeding the coal; mechanics do the work of firing; mechanics remove what ash there is left, and the efficiency of those boilers under that new system is increasing by leaps and bounds.

Heretofore in a steam plant coal has been the great item of cost in producing electricity, although, of course, labor has also entered into the factor of cost. Great economies are being effected through the use of powdered coal blown into the fire box and through the consequent elimination of labor. We are on the threshold of definite cost reduction of electricity made from coal. There is going on day after day in this country the development of this new method of using the great power that lies stored up in our hillsides in the form of coal. So I say that to-day we are on the threshold of a great change. The new method of using powdered coal is employed only in two or three great plants at the present time, but business men the country over are making inquiry and are going soon to ascertain that their old plants are obsolete and that in order to enable them to make further economies they have got to come to the new method.

Furthermore, engineers tell us that there is held out another bright prospect for the reduction of the cost of electricity produced by steam. For years experiments have been going on in connection with the low temperature distillation of coal, which means that from the coal such as has been burned and wasted and sent up the chimneys in smoke for generations past they are going to take by-products eventually which will be equal in value, perhaps, to the coal itself, so that the resultant material, the coke, or whatever it may be called, may be burned under the boilers and the most efficient methods of production may be obtainable at practically no cost for fuel. Those experiments are going forward. Some think they have already reached a practical result; but, whether they have or not, the promise that lies in them is well worth our consideration here and tends to show that the opportunities of cost reduction in production of electricity by steam warrant us in saying that the Appalachian section, where water power and coal lie side by side, and with a difference of only one-fifth of a cent a kilowatt-hour existing in the present cost as between water and steam, steam itself has a better opportunity to become the low-cost producer than the water power of the Appalachians. The use of such water power requires not only a plant and a dam to confine the water, but requires a supplementary steam plant, a stand-by plant along with it, in order to make the primary water power effective.

I confine my talk to you, Senators, to the Appalachian system because the same considerations do not apply to the difference in cost between water power and steam power in the Rocky Mountains and any other sections where you are far from the coal fields. We are speaking of a definite point, a point in the regenerated South where we call for power daily for new industries; where by climate, by natural resources, by the availability of power, and by every right of conquest, industry to-day is taking its just place in the economic status of this Nation. That is a thing that we ought to consider; and its relevancy, if I may so call it, may be instanced in this way:

If the city of Birmingham, Ala., which is within transmission distance of Muscle Shoals, were sufficiently interested in the experiment of municipal ownership and municipal operation or governmental operation, which the Senator has so cleverly put into his joint resolution, it could build within its own borders a modern steam plant and get electricity at a cost practically no greater than that for which it could buy it from Muscle Shoals under Government operation. It could distribute it as well from the steam plant within its own borders as it could distribute the current that it got from Muscle Shoals. It would bring to the people of that territory electricity under its own municipal operations without having to go to the Government and get them to bring about the sale of electricity to it from Muscle Shoals. I do not know why Birmingham does not do it. It probably has not wanted to do it; but it is available.

Mr. HOWELL. Mr. President——

Mr. SACKETT. I yield to the Senator from Nebraska.

Mr. HOWELL. Is it not a fact that the tremendous advantage of a central station operated, say, by the Government, together with its transmission lines, is the reason why a city can sell electricity so much lower when it merely has to install its own distribution system and operate it?

Mr. SACKETT. Tell me why can not the city of Birmingham, Ala., do the whole thing just as well within its own borders as it could if it could buy the electricity from Muscle Shoals? It does not have to pay any great price for money. Its credit is high. It has to pay for Muscle Shoals an interest upon the cost to the United States. It would have to pay an interest upon the cost of its own steam plant. The best that it could expect to gain by going to Muscle Shoals would be one-fifth of a cent a kilowatt under its own modern steam plant; and I can not conceive why the United States Government should go into what the Senator from Utah calls this paternalistic method in order to enable a great city like Birmingham, which has its own resources, which is located right on the coal fields, to purchase electricity at a possible advantage of one-fifth of a cent per kilowatt.

Mr. FESS. Mr. President, will the Senator yield?

The PRESIDING OFFICER. Does the Senator from Kentucky yield to the Senator from Ohio?

Mr. SACKETT. Yes.

Mr. FESS. I have listened to the Senator, and I think the compliment is due him that his address is one of the best addresses I have heard since I have been a Member of this body. Being strongly impressed by his discussion, I desire to ask him what the solution of Muscle Shoals is. I understand that the Senator has not accepted the Norris joint resolution, and I have not been able to do it myself; and I understand that he has not accepted the Madden-Willis proposal, and I have not been able to do that either. I am wondering whether he has a concrete solution of it.

Mr. SACKETT. I thank the Senator for his kindly reference. I have a concrete solution. It is not a solution that brings any great advertisement in itself. It is a solution of this character:

That the Government ownership of Muscle Shoals is essentially, primarily, and ultimately a fertilizer proposition for the help of the farmer; that as a power proposition it is but one unit in all the great Southland; that if it had not been built by the Government for the specific purpose of making nitrogen it would not have been built by the Government for producing power, and in my judgment, on account of the wide fluctuations in the river at that point, it is doubtful if it would yet have been built by private parties as a water-power plant. It would eventually, but I doubt whether it would have been built just yet. I treat it as an isolated instance to-day.

Every State in the South, so far as I know, has its public-utility commission in charge of electric rates. I do not want the United States Government to come into my State and fix the rates at which electricity shall be sold. We have some ideas in my part of the country that perhaps the lowest rate is not always the best rate. I think it was instanced the other day by the Senator from Nebraska [Mr. NORRIS] when he referred to the New Jersey municipality which preferred to advertise to the world that it had no municipal taxes rather than to reduce the price of electric power within its borders. It used the profits which it made under the normal price for which it sold electricity in order to pay all the municipal taxes, and it thought it was better business.

There are other instances of the same kind that could be multiplied; but we do have public-utility commissions under the control of the legislatures of our States to protect our people. We adopted them in the early days for the very purpose of seeing that our people were not overcharged for their electrical requirements. The idea of inaugurating now a different plan, based upon municipal or governmental operation, to strengthen and reinforce and change the very things which we have appointed our own commissions to determine is abhorrent to me. I think we are amply protected, and if we are not, the remedy is in our own hands.

Being protected in that way, my theory is that in view of the need and requirement of agriculture for fertilizer, in view of the fact that under our war-time appropriations we dedicated this plant in the South to the nitrogen-production business, and in view of the fact that if you make nitrogen in time of peace for agriculture you automatically make nitrogen in time of war through taking over the plant, I advocate that we should so use the Muscle Shoals power plant that we get out of it the highest possible income, and we should apply that income to experimental work and to large-scale production work for making a concentrated fertilizer and for getting it used upon the farms of this country. Then I say further—if the Senator from Ohio will listen; I come now to the important point—that in order to get the highest income out of the Muscle Shoals power plant it ought to be offered freely to the country, to that man or that set of men who will pay the highest price for it, because it is not going to help to sell that power for us to restrict the use that anybody will make of it. Every restriction that you put upon it requires a prospective lessee to consider just how much less the power is worth to him.

I know that I subject myself to the accusation that in offering this power freely to the country it will be said that I am turning it over to the great predatory corporations who distribute electric power. I can not help it if that charge is made. It is common sense that if you want money out of a property you must offer it in such a way that you will get that money. It is not going to help you to restrict it to require that the power be distributed, first, to municipalities, and, second, to States, or anything of that kind, and for this reason:

You ought to visualize the South as an entire entity. Political subdivisions in a growing industrial community mean nothing. Every State and the border of every State is in competition for industry to-day with every other State and the border of every other State. Alabama has to insure to the factories that are going to come there as cheap power and as good service as are going to be insured to those of Georgia, or else Georgia is going to get those factories. Every interest of the people who live in those States is in seeing to it that there shall be a distribution of power over the whole State.

The great power companies of the South to-day cross State lines. They are interwoven. They are gradually approaching a time when there is going to be one central reservoir from which leads will go in all directions; and whether the power is made at Cove Creek or whether it is made at Muscle Shoals or whether it is made on the Tallapoosa or any other river, into that great reservoir is going to feed all the power of the various water powers and their auxiliary steam plants.

The people of the South are going to draw power from that reservoir, and it is going to reach into every hamlet where the demand for electric power justifies the investment of the necessary capital in transmission lines to take it there.

Nothing that the Senate can do, no restriction that it can put upon its use, is going to change one iota in the period of time to come the distribution of electric power from any single unit in the South. It is a practical, common-sense problem that anybody who has ever had anything to do with the distribution of an electric current appreciates.

I therefore urge you to authorize the Secretary of War to lease the power at Muscle Shoals for the highest price he can get for a period of time that will warrant a bidder in coming in and making a high bid. In the substitute which I have offered I have put no qualification as to its use, except to reserve to the Government the right to use such power as may be necessary for its own purposes, at a price of $15 per horsepower per year, which is under the cost of production.

I want the Secretary of War to offer that power under a lease for 15 years, which would warrant anybody in building a transmission line to meet it. I want to give him the right to put in the additional units of the steam plant and the water plant, if he desires to. It is not everybody who would lease Muscle Shoals who would want those units put it. I want to leave it open to the bidder to supply those units—or so many of them as he desires—and I want to agree to buy those units back at the end of the lease less obsolescence and depreciation, ordinary wear and tear excepted.

I want to get every dollar I can out of Muscle Shoals. It will be more helpful to the people of the South if the power leased to any company or any set of men is distributed into the general reservoirs than if we try to divide up the 160,000 horsepower among nine States, among a thousand communities within the nine States, and after the subdivision be able to give every one of them a hundred kilowatts, and then provide the money to build a transmission line to get it to them. I shall ask for a vote upon the substitute that I have offered at the proper time.

Mr. SMITH. Mr. President, I do not intend at this time to make any extended remarks on the subject, but I do think that a lot of misinformation, honestly given, but nevertheless misinformation, has been scattered abroad among the Members of the Senate who are not as familiar with the fertilizer question as are those of us who have to use fertilizer. The Senator from Kentucky spoke about phosphoric acid and the processes that are now being developed for the concentration of it. I want to state here and now that there is not a practical farmer in America who uses fertilizer who will not testify that there is in this country all the phosphoric acid we want, obtainable at a price that is entirely reasonable, and the supply is unlimited and practically inexhaustible.

There are the phosphate rocks of Tennessee, there are the phosphate rocks of Florida, there are the phosphate mines of South Carolina. The amount of phosphoric acid is practically unlimited, and with hardly any cost, except for transportation, and the mere mechanical method of treating the phosphate rock with sulphuric acid, which produces all the phosphoric acid we need. I can get it to-day, manufactured at Charleston

and delivered in the territory 90 to 100 miles away, for $9 and $10 a ton.

Mr. McKELLAR. And some soils do not require potash.

Mr. SMITH. As the Senator from Tennessee indicates, some soil does not need any potash at all. The alluvial deposits in the bottom lands and the overflowed lands that have been reclaimed from the rivers are rich in phosphoric acid, as well as in potash. That is one ingredient. There are three ingredients in most of our fertilizers, especially those used on depleted or what they call worn-out land, phosphoric acid, potash, and nitrogen or ammonia, which are interchangeable terms when it comes to the question of plant food.

As to potash, it is as cheap now as phosphoric acid, or cheaper, because there is an unlimited supply of it already manufactured by nature in the great German potash wells. The fact of the matter is that potash, in the form of what they call *kainit*, has been brought over to this country in ballast and sold at an out-of-pocket cost in order to help defray the expense of bringing the vessel over. The agricultural interests of this country do not need the production of another pound of potash or of another pound of phosphoric acid, because the prices are now extremely reasonable.

Let me give some facts. I have not prepared myself as I should have done before attempting to make even this short statement in order to correct impressions that are being made that might affect a very vital piece of legislation as far as agriculture is concerned.

The ordinary commercial fertilizer, what we call the mixed fertilizer, runs in percentages of these three ingredients, and there are none others. One farmer may want 8–2–2, 8 per cent phosphoric acid, 2 per cent potash, 2 per cent ammonia. Some farmers may want 8–4; that is, 8 per cent phosphoric acid, no potash, and 4 per cent ammonia. If he is in the Piedmont, in the red lands, he does not need potash; the color of the soil indicates that there is plenty of it available, and he does not need any more. But in the gray lands, in the coastal plain, from the foothills to the seaboard, the color of the soil indicates, perhaps, the need of potash. If there is not potash in that kind of soil, cotton is subject to what is known as rust; the leaves shed off during the period when it should be flourishing and growing. The phosphoric acid is also indicated in soils of that kind.

Even there, however, you can find a substitute very often, in the presence of humus in the ground, for either one of these two ingredients, phosphoric acid or potash. You can plant some crop that will grow luxuriantly, turn it under, and furnish your land largely with these two ingredients; but the sine qua non is nitrogen or ammonia.

As I started to say a moment ago when I was diverted—I have not thought this thing out and I should not get off on a tangent, even in my own statement—I said I had bought my fertilizers for this year. The relative cost of my 8–4–4, which I bought, I will explain a little later. My phosphoric acid cost me at the rate of about $10 a ton delivered. I will put it at the maximum. That is, $10 per 2,000 pounds, with a 16 per cent content. My potash cost me about the same, with about a 12½ per cent content, $10 a ton. My nitrate of soda, which had in it only 18 per cent of nitrogen, cost me $60 a ton, and that is the cheapest form of available ammonium we can get. We get it from Chile; it is imported from Chile. Not only is it perhaps the cheapest, taking into account the real nitrogenous content, but it is the most easily available, the most easily handled. It lends itself more readily to the customs and practices of the users of fertilizer in America than any other fertilizer known. Mark you, 16 per cent phosphoric acid, $10 a ton; 12½ per cent potash, $10 a ton; 18 per cent ammonia, or 16 per cent of its equivalent in nitrogen, $60 a ton.

What other sources are there? Blood and tankage, rich in ammonia, $75 to $80 a ton. The percentage of ammonia is high. Fish scrap, which is rich in nitrogenous content, and cottonseed meal, which is not so rich but which is easily soluble and available for plant food at 7 per cent.

Mr. President, the problem for the farmer is to get available ammonia, or nitrogen; they are convertible terms. I state here on the floor of the Senate, without the possibility of truthful contradiction, that crops in this country can be made abundantly if there is neither potash nor phosphoric acid. Clemson College, one of the great agricultural institutions of this country, located in my State, through a series of experiments proved that a maximum corn crop could be made with no other fertilizer applied but nitrate of soda.

Mr. SIMMONS. And, Mr. President, that is used in the concentrated form.

Mr. SMITH. It is a reasonably concentrated form.

Mr. SIMMONS. It is put out by the farmer with his hands.

Mr. SMITH. With his hands. It is absolutely innocent of any ill effects upon the individual who handles it. It is clean. It is as white and as attractive in appearance as salt.

Mr. SIMMONS. I will ask the Senator if it is not true that in the coastal sections that is about the only fertilizer we use on corn.

Mr. SMITH. As I just started to remark, Mr. President, following the indication of the agricultural college in my State, down in the coastal plain of South Carolina, in Lee County, I planted 12 acres of corn in 1927. We had a short session and I was at home and could give this little crop of mine my personal attention. I used nitrate of soda alone, and used not to exceed 300 pounds to the acre, a large fertilization for an 18 per cent ammonia, and I averaged ninety-seven bushels and a half to the acre.

Jerry Moore, in my State, according to the Department of Agriculture, by the use of highly concentrated nitrogenous fertilizers, made 235 bushels on 1 acre. If he had put an excess of phosphoric acid and potash on his land it would have destroyed the productive power of the land.

Mr. Drake, of whom the Senator from North Carolina has heard, just preceding the exploit of Jerry Moore, according to the department of agriculture of my State and the Agriculture Department of the Government, made 250 bushels of corn on 1 acre by the use of nitrogen.

I sit here and listen to Senators say, "Let us get a mixed fertilizer." I wish the junior Senator from Georgia [Mr. GEORGE] was here, because he is like me in this respect. He has a liability of several hundred acres known as a farm. At the present price of farm products in their relation to other products it is a liability rather than an asset, but I wish he were here so that I could ask him what he would give any fertilizer company to mix the ingredients for his balanced fertilizer for his crops. The Senator from Tennessee [Mr. MCKELLAR] has just suggested that he has mixed many tons. Why? On rainy days, which are generally more numerous in the spring than at other times, the practical farmer will take his cottonseed meal, which is his nitrogen, 7 per cent, his phosphoric acid, and other ingredients which all come in separate sacks. He will get his hoes and his hired hands and get under sheter and calculate what percentage of each he wants. Then he will mix those ingredients and put them back in the same sacks. Why does anyone come here and talk scientifically about a mixed fertilizer? What we want is nitrogen. Nature has provided the other two almost indigenous to the soil, but she has not provided that life-giving element, without which no plant can live and thrive, known as nitrogen.

Mr. SIMMONS. Mr. President, may I ask the Senator a question at that point?

Mr. SMITH. Certainly.

Mr. SIMMONS. The Senator stated, and stated correctly, that nitrogen is used just as it comes, in its concentrated form. Can cyanamide be used in that way?

Mr. SMITH. The experience of my people in the use of cyanamide was very unfortunate. Cyanamide means a lime container for the nitrogen. It does not adapt itself to immediate used on the farm. It is available in the fertilizer factories as a sort of nitrogen or ammonia. After it has been mixed, it does not have the effect on the hands of the individual or perhaps on the soil that it has in the form in which it comes from the factory. To answer categorically the Senator's question, I do not believe there is a farmer in America who can use cyanamide as cyanamide and apply it to his land.

Mr. MCKELLAR. The effect of it is to burn the crop.

Mr. SMITH. One of the officials of the Bureau of Chemistry claims that there is a very distinct poisonous effect upon the land where it is not judiciously or scientifically used. As to that I do not know, but I do know that it did have a very disastrous effect on the hands of those who attempted to put it out in the form in which it comes from the factory. In addition to that, my information is to the effect that it was not a quickly diffusible form of ammonia. What I mean by that is that the plant does not assimilate it half so readily as it does either nitrate of soda or fish scrap. It is slower in its process of assimilation and doubtful in its effect upon land, but it is nitrogen and not, in that form, available for the farmer.

Mr. SIMMONS. The point I wish to make is that cyanamide can not be used for the purposes of fertilizer except in mixed fertilizer.

Mr. SMITH. Yes; that is my experience.

Mr. SIMMONS. If the Senator will permit me, I would like to read just a few lines from a letter which I received this morning from an official of the Department of Agriculture who visited me on yesterday. I requested the department to send a man who had knowledge on the subject to discuss the matter

with me. Here is a part of the letter he wrote to me, the balance of the letter not relating to this subject:

After my conference with you yesterday I was able to get in touch with Doctor Ross, of the fertilizer investigation laboratories of the Department of Agriculture, who has just returned from a visit to the laboratories at Niagara Falls, where cyanamide is produced. He said that the estimated production of cyanamide for 1928 was 135,000 tons, most of which will be sold in the United States. Last year approximately 90,000 tons of cyanamide was used in the United States in mixed fertilizer. Doctor Ross says that cyanamide is used principally in conditioning mixed fertilizer. When from 50 to 60 pounds is added per ton of mixed fertilizer it reduces the acidity of the fertilizer and eliminates the tendency of the fertilizer to cause acid soil. When used in greater proportion than this it has a tendency to injure the plant, because when cyanamide is treated with water it reverts to an acid which injures the roots of the plant. A small percentage of the cyanamide used in this country is also reduced to ammonia phosphate for use in mixed fertilizer. The use of cyanamide in the United States is increasing quite rapidly because of its value in conditioning mixed fertilizer.

Mr. SMITH. That is the very point. That bears out what I said a moment ago.

Mr. SIMMONS. Of course the Senator knows a considerable amount of it is also used in refrigerating plants.

Mr. SMITH. That bears out what I said, that if the farmer is to get the benefit of cyanamide he must also pay the cost of the mixing machinery that mixes it at the fertilizer plants.

Mr. BLACK. Mr. President, may I ask the Senator just a question?

The PRESIDING OFFICER. Does the Senator from South Carolina yield to the Senator from Alabama?

Mr. SMITH. I yield.

Mr. BLACK. The Senator did not understand either myself or my colleague or anyone else to be advocating the use of cyanamide as fertilizer, did he? If so, I want to clear up that situation.

Mr. SMITH. I got the impression that the Senator said it might be used directly.

Mr. BLACK. Cyanamide?

Mr. SMITH. Yes.

Mr. BLACK. Oh, no. I have stated that it was not used directly and in my judgment would not be used directly. That is, the Senator will understand, only a step in the cyanamide process. From it they extract the ammonia. That is the last step in the cyanamide process.

Mr. SIMMONS. What is that?

Mr. SMITH. That is where they produce ammo-phos.

Mr. SIMMONS. I would like to read something about ammo-phos from the letter to which I just referred:

Ammo-phos produced by the laboratories at Niagara Falls is not sold in the United States. The principal market for this product is in the West Indies.

This letter is signed by C. M. Purvis, associate agricultural statistician, division of statistical and historical research.

Mr. SMITH. I would not pretend to try to speak as to the form of reducing the nitrogen, which is incident to cyanamide, to ammoniated phosphate. That is what ammo-phos is—phosphate of ammonia. They treat phosphate rock in the presence of the nitrogen and the cyanamide, and produce ammonium phosphate. I do not think any practical farmers would care for them to mix ammonium phosphate for them, when, if they can get all the ammonia they want, they can get all the phosphate and all the potash they want and will do their own mixing, thereby saving from $3 to $4 a ton, which is the cost of the artificial process of mixing, which does not add one penny's worth to the value of the thing the farmer buys.

Mr. SIMMONS. Mr. President, will the Senator pardon me for another interruption?

The PRESIDING OFFICER. Does the Senator from South Carolina yield further to the Senator from North Carolina?

Mr. SMITH. I am glad to yield.

Mr. SIMMONS. I think the Senator has stated the case admirably and that he has made it very clear that the high price the farmer is paying for mixed fertilizer is due to the high price of nitrates in the fertilizer. I think it ought also to be said that most of the fertilizer factories in the country are simply assembling and mixing plants.

Mr. SMITH. That is true.

Mr. SIMMONS. They buy their phosphate, they buy their potash, they buy their nitrate of soda, and then mix them. I think it can be said that most of the producers or assemblers and mixers of fertilizer in the country did not make any money to speak of last year. The high price of fertilizer was not due to any high profits that they made. It was due chiefly to the high price they had to pay for the nitrogen in the mixture. This year the assemblers have increased the price about 9 per cent, I think. Is not that correct?

Mr. SMITH. About 10 per cent.

Mr. SIMMONS. But last year, taking the industry as a whole, they lost money. They did not make money. My complaint, therefore, is not against the assemblers of the materials and their conversion into a mixed fertilizer. My complaint is against the unnecessary high price that we have to pay for nitrate of soda which is in the mixed fertilizer as now used by the farmer. I agree with the Senator that it is possible for the Federal Government to take hold of this question vigorously and with determination, and for the Government to discover and develop some process by which nitrogen can be extracted from the air and sold to the farmers at a reasonable price. There is the heart of the whole controversy, in my opinion.

Mr. SMITH. I think the effect indicated by the Senator, that we might find some process which would cheapen the cost of nitrogen to the farmer, has already been had. I am not in a position to state, as I hope to be able to state before this year is over, not what are the possibilities, but what are the actual accomplishments of the synthetic process now in operation in this country in developing, in an available form, nitrogen from the air. When I say "available form," I mean in a form that is immediately available for the man in the field. I think that the development of the process up to the present time has so convinced the fertilizer people and the capitalists of the country that it has already had its effect upon the price of nitrate of soda.

I do not intend to take up any more time now on that matter, because I want to speak at length later; but at this time I want to call attention——

Mr. McKELLAR. Mr. President, before the Senator leaves the question he has been discussing, will he give us the price of nitrate of soda last year and the year before as compared with this year, so we can have those figures before us?

Mr. SMITH. I do not think there has been, until quite recently, any change in price. The price year before last and last year and this year ran pretty uniform up to within a comparatively short time ago, when it dropped about $8 or $9 a ton, which in fertilizer circles was attributed to the effect of the different synthetic processes in producing ammonia for fertilizer purposes.

Mr. BLACK. Mr. President, will the Senator from South Carolina yield to me now?

The PRESIDING OFFICER. Does the Senator from South Carolina yield to the junior Senator from Alabama?

Mr. SMITH. I yield.

Mr. BLACK. I have been informed, and I have sought diligently to ascertain whether or not it is true, that there is not a particle of ammonia which is manufactured by the synthetic process in America which has gone into any fertilizer. I have been informed by the Senator from Nebraska [Mr. NORRIS], and I have received that information from numerous other persons, that there has not been one pound of ammonia produced by the synthetic process in America that has gone into fertilizer.

Mr. SMITH. I rather think that the Senator from Alabama is correct, but in its present stage it has gone into the refrigerating plants; it has gone into chemical production; and fish scrap, tankage, and the by-products of the coke and coal ovens, which are readily available for fertilizer purposes, have found their place in the fertilizer market because they have been substituted in chemical production by the synthetic ammonia.

Mr. BLACK. Let me suggest one other thing at this point. I have in my office a statement, which I cut out of a newspaper two days ago, that fertilizer instead of going down in price has gone up in price. That may be wrong, but I merely cut the clipping to that effect out of a newspaper.

Mr. SMITH. In that connection I desire to say that I think, perhaps, the Senator will find that all the fertilizer companies in America united in a statement, and the Senator from Georgia [Mr. GEORGE], who unfortunately, like myself, has to buy fertilizer, will bear me out in this, that the companies got together and said, "We lost so much money last year that we have to raise the price of fertilizer this year in order to recoup our losses." That was not so much because the ingredients which composed the fertilizers themselves had gone up, but that the companies claimed they had to recoup their losses for the preceding year. I will ask the Senator from Georgia if that is not his understanding of the situation?

Mr. GEORGE. That is my understanding.

Mr. McKELLAR. I wish to ask the Senator from South Carolina, in that connection, if it is true or not that this same combination of fertilizer companies sell to the farmers at a price that is very much larger for credit than for cash?

Mr. SMITH. I positively would be ashamed of the business ability of my people if I were to quote the actual difference between the cash prices and the credit prices of fertilizer companies for the fertilizer sold to farmers.

Mr. McKELLAR. However, I hope the Senator from South Carolina will do so.

Mr. SMITH. The difference between the cash prices of those companies and their time prices reflects on the worth of the moral risk of the farmer who has to buy on time, and shows that the companies are even willing to take that risk, that they consent to take it, and if they can collect some of the exorbitant difference between the two prices they will break about even. For instance, I think the fertilizer which is known as 8–3–3 would cost on the market, free on board, $22 a ton if sold for cash, but its price would be $32 a ton if purchased on time.

Mr. BLACK. The Senator knows as to the credit price merely from hearsay, does he not?

Mr. SMITH. My heavens, no; I do not know about credit prices from hearsay, but I know about them because of the acid test of actual experience.

Mr. McKELLAR. There is a difference in price of $9 a ton, is there not?

Mr. SMITH. There is a difference of from $9 to $10 a ton; yes. But I want to get back to what the Senator from Kentucky said. I hope he will correct his speech where, if I understood him correctly, he said the greatest desideratum was to get phosphoric acid. Mr. President, the cheapest and most unlimited form of fertilizer known to agriculture is phosphoric acid. One can get all he wants of it in any per cent he wants in unlimited supply. All that is necessary to be done is to grind the rock rich in phosphate, treat it with sulphuric acid, and the resultant product is phosphoric acid. It is not even necessary to get a container, but the rock when it is ground, after it absorbs the sulphuric acid, it is converted into phosphoric acid. The manufacturers just grind up the rock, let it stand a while, then dump the dust into big tanks, mix the sulphuric acid with it, and then put it in a sack and ship it. Nature has very nearly done the whole work herself.

As to potash; it is not necessary to treat it at all. It is pumped from the potash wells in Germany or it is mined in the salt form, in the form of kainit, and sacked and shipped in ballast, and sold at the "out-of-pocket" cost; or it is put in solution and evaporated so as to be put in the form of muriate of potash or sulphate of potash, with 40 to 45 per cent of potash content, and the purchaser pays proportionately more but reduces the freight rate.

The Senator from Kentucky was talking about phosphoric acid. There was an attempt made down here at our nitrate laboratory to see if there was any other process by which phosphoric acid could be obtained from the phosphate rock without treatment by sulphuric acid. Under a chemical process of which I do not know, but this was testified to before our committee, that phosphate rock of such a low per cent of phosphate that it did not pay to mine it—for the container would probably cost more than the percentage would justify—by putting it in a superheated furnace and taking common sand from the road or wherever it was found and just shoveling it into the furnace there was precipitated an acid from the sand which readily united with the phosphate from the rock and produced as good phosphoric acid as was produced by the sulphuric-acid process.

That discovery was hailed with great delight, and I do not know but it will become a practical thing for this reason: We had to abandon the phosphate beds of South Carolina because the iron content of the phosphate rock was so great, the per cent of pyrites in it or the iron in it was so great, that when the rock was treated with sulphuric acid the iron neutralized the sulphuric acid and no phosphoric acid was produced. It was found, however, that by the sand process it did not make any difference how great was the iron content, it did not affect the production of the phosphoric acid. That is one of the things that we would hail with great delight and it would possibly result in benefit.

As to the question of concentrated fertilizer, let me tell my colleague that the farmers can wait, and wait profitably, if they can only get an abundance of nitrogen at anything like the present cost of potash and phosphoric acid. It will cut his fertilizer bill by half.

So, Mr. President, I am not so much interested in the talk about concentrated fertilizer or mixed fertilizers as I am interested in having Muscle Shoals devoted to the extraction from the air of this sine qua non of the vegetable world—nitrogen.

Mr. SIMMONS. Mr. President, I should like to ask the Senator from South Carolina, who knows much about this subject and has studied it a great deal, and is also a farmer, leaving out the question of freight, does not the farmer prefer a mixed fertilizer to a concentrated fertilizer?

Mr. SMITH. At the present stage he does, because the machinery is not adapted to the use of the concentrated fertilizer.

Mr. McKELLAR. He would have to be educated up to its use?

Mr. SMITH. Yes. Let me give the Senator an illustration.

Mr. SIMMONS. Before the Senator answers that question, let me ask him another question, which he can answer in connection with the first one. Although the farmer may have to pay a little more freight because of the filler in the mixed fertilizer, can he not distribute the mixed fertilizer cheaper than he can distribute the concentrated fertilizer?

Mr. SMITH. Yes; I think it would call for a new kind of machinery. Let me give the Senator an idea as to that. The present fertilizer distributor is so constructed that when we put out, say, 200 pounds of fertilizer to the acre in that form, let us say a potash, it is a mere trickle; one can imagine what 200 pounds of dust would be to an acre; but it is put in a furrow, and that 200 pounds contains only 32 pounds of actual phosphoric acid. Here is a delicately adjusted piece of machinery, distributing actually, according to the width of the rows apart, 200 pounds. If 32 pounds were put out, it would be necessary to get entirely new machinery. However, that is not the thing that concerns the American farmer to-day. The essential thing is to give him nitrogen. He can get all the other ingredients he wants.

Now, as sensible men here why should we be haggling about fertilizer and concentrated fertilizer when the cry of the earth is for replenishment with nitrogen. It is possible to double the wheat crop of America with nitrate of soda; we can quadruple the corn crop with nitrate of soda; we can take a sand hill—and I say this in the presence of the Senator from North Carolina and the Senator from Georgia—that will barely sustain the life of the roughest kind of deep-rooted grasses, and by the application of nitrate of soda in the presence of moisture make a corn crop equal to that produced in the bottom lands of the Mississippi. There is no limit except in the possibility of the lands to sustain life with the other chemicals that are indigenous to the soil. Therefore I say we should lay aside any question of potash, any question of phosphoric acid, any question of concentrates, and devote ourselves to relieving agriculture of the intolerable burden placed upon it.

How may we do that? As sensible men proposing to legislate for the benefit of agriculture how are we going to do it by saying that we will take the cyanamide process? What do we know about that process except what has been stated to us and what we have learned from the little experiments we have made in our own fields. What about the synthetic process? What do we know about the possibilities of that? Is it not our duty to cause our Government, which we have delegated to do this thing, to take the power at Muscle Shoals and develop the basis by which nitrogen can be extracted and given to the American people.

I want to state frankly that it is not so much a question with me by whom to do this as it is, "Go and do it." I believe, as the Senator from Nebraska [Mr. NORRIS] brought out here, that the Government must do the "dead work," which is a term used by all inventors. The deadly part of an invention is developing the process until it becomes practical.

Now I want to ask the Senator from Tennessee [Mr. McKELLAR] and the Senator from Utah [Mr. KING], as practical men, what can be expected from these companies that are manufacturing fertilizer now, or, rather, mixing it. They do not manufacture anything; they mix it. They have no extra machinery other than just a mixing plant—some revolving things, some wheels, and a chemist to figure just how much of each ingredient to put in to have an 8–3–3 mixture or an 8–4–4 mixture. How many of those companies do the Senators suppose are going to go down yonder to Muscle Shoals and spend millions of dollars on the doubtful outcome of a machine to get nitrogen from the air? How many does the Senator from Tennessee expect to start in at that?

Mr. McKELLAR. I do not expect any.

Mr. SMITH. How many does the Senator from Utah expect to start in at it?

Mr. KING. Does the Senator want me to answer that question?

Mr. SMITH. Yes; I do.

Mr. KING. Mr. President, a few years ago I had the pleasure of visiting, with the late Senator Ladd, a number of the cyanamide and synthetic plants in Germany which were extracting nitrogen from the atmosphere. One of the plants that I visited had an enormous receptacle, nearly as large as this Chamber, into which was poured, from spouts above, the product, the nitrogen from the atmosphere. They had so perfected the chemical art, if I may so denominate it, that they

had no fear at all of their ability to get nitrogen from the atmosphere; and five hundred millions of dollars—it was inflated, it is true—was expended on those plants for the purpose of manufacturing nitrogen.

Mr. SMITH. That was under the auspices of the Government, was it not?

Mr. KING. Oh, no, no. It was done by private individuals. Not a single one of those plants was conducted by the Government, according to my advices.

Mr. HOWELL. The Government had furnished part of the money.

Mr. SMITH. That was my information.

Mr. KING. No; at least, those with whom I talked had erected the plants with their own capital.

Mr. McKELLAR. What year was that?

Mr. KING. That was in 1924.

In the United States the Allied Chemical Co. has manufactured nitrogenous products. and is now manufacturing nitrogenous products. The Cyanamid Co., by its process, extracts nitrogen from the atmosphere. We have in the United States some of the ablest chemists in the world, who are addressing themselves to this question. I think, profiting by the experience of the chemists in France, in Italy, and particularly in Germany, they are perhaps improving upon processes heretofore existing just the same as in the metallurgical world improved processes have been developed.

For instance, if I may divert, a few years ago in the West all of our minerals that contained arsenic were base; and millions of tons that were taken from the ground had to be thrown over the dump because the smelting charges were so high, and the arsenical element therein made the smelting of the product almost impossible. Now that is not done. A few years ago ores that had zinc in them were penalized. The zinc, valuable as it is, was a disadvantage and a handicap; and a man that sent a ton of ore that had a 10 or 20 or 30 or 40 per cent zinc content got less for it than if it did not have an ounce of zinc in it.

Mr. SMITH. Let me ask the Senator a question. He has gone far enough to illustrate what I asked him.

Suppose the extraneous matter that made it unprofitable to mine that ore did not make it unprofitable to mine it from the miner's standpoint, and he could sell it at a reasonable profit. Do you reckon he would have gone to all the expense and trouble of getting rid of that noxious element that affected his market? The question I asked the Senator was, as long as the fertilizer mixers of this country get the raw material in abundance to meet their needs and are able to fix their prices and to sell their stuff at a profit, when do you suppose they will go to work to develop a process that will cheapen the product and lessen the profits per ton that they now are obtaining?

Mr. KING. Of course, human nature is human nature——

Mr. SMITH. Exactly. That is the point I am making.

Mr. KING. And if nitrogen can be obtained from Chile and laid down here, say, at $10 a ton, just for illustration, chemists are not going to waste much time in devoting their capital and their efforts to extracting nitrogen from the atmosphere. As the Senator knows, however, with the inventive genius of the United States and with the great amount of capital for investment in the United States, whenever a product is needed and there is a possibility of success and profit in the enterprise, American capital is venturesome.

Mr. SMITH. I grant that; but the point I am making, Mr. President, is that in the first place the same principle applies here that applied in the radio question—a great revelation, as it were, to the genius of the country that messages could be sent through the air. Instead of its being a boon to all mankind, what has happened? In the first place, under our patent laws—which I do not criticize, because I think we ought to encourage the invention of these things that have made this age a marvel—the inventor, nine times out of ten, is the man who gets the least out of his invention. At the very birthplace of these marvelous revelations stands organized capital, which seizes upon the discovery and makes what should be its blessings a means of burdening and cursing the American people.

I have stood amazed at the revelations before the Patents Committee of what is being done in controlling the patents that make possible the transmission of messages through the air. The same thing is true of these scientific processes; and there is no one in America that can stand between the great mass of the unorganized producers and laborers of this country and the great organized capital of the country save the American Government.

The Senator says human nature is human nature, and that is true; and—

> The good old rule
> Sufficeth them—the simple plan,
> That they should take who have the power,
> And they should keep who can.

That has been the doctrine from the day that Wordsworth put those words into the mouth of Rob Roy, and before. So, as I had the honor of being the author of the Muscle Shoals act when first passed, with the object in view of utilizing the discoveries of science for the relief of the agricultural interests of the country, I stand here to-day and plead that the Government stay in this work until it shall have demonstrated beyond the cavil of any Senator here that it can or can not produce nitrogen in such quantities and at such price as to bring about the fruition of the hope that was in my heart when I introduced the original measure.

Mr. KING. Mr. President, may I be permitted, then, to draw the deduction from the Senator's concluding statement that he does not favor the subordination of agricultural development—that is, the production of fertilizer for agricultural uses—to power, and he is not in favor of turning Muscle Shoals over to power development, whether operated by the Government or operated by private individuals? He prefers to hold Muscle Shoals and the power potentialities of Muscle Shoals for the development of nitrogen or fertilizers for use on the farm?

Mr. SMITH. Unquestionably.

Mr. BLACK. Mr. President, I think, from the Senator's remarks, in which I have been very much interested, that he and I are practically 100 per cent in accord. While the Senator was talking, the junior Senator from Georgia [Mr. GEORGE] told me that he had just bought some Chile nitrate at $60 a ton. Figured out, that made the nitrogen content cost him 19 cents a pound.

The Senator from Nebraska [Mr. NORRIS] stated on yesterday that Doctor Cottrell and two other scientists had told him that nitrogen could be extracted from the air by the synthetic process for 4 cents. Doctor Cottrell also testified before the Military Affairs Committee yesterday, and so told me again this morning, that under the cyanamide process, nitrogen, ammonia—I am not talking about cyanamide; let us forget cyanamide; that is just one of the steps—ammonia could be extracted from the air at a cost of between 5 and 6 cents. My figures the other day were larger. He said, too, that in figuring the 5 and 6 cents he did not take into consideration a reduction for the by-products, nor did he know of the difference in labor—he had not informed himself on that—and that both those things would bring down the figure.

At any rate, under the recognized scientific statements of all of these gentlemen, we can get nitrogen from the air now for between 4 and 6 cents. My position, with which I think the Senator is in full accord, is this: Why delay a day in experimenting with anything, when the Senator from Georgia is buying nitrate at 19 cents and every one of these people tells us that it can be made for from 4 to 6 cents?

Mr. SMITH. If the Senator from Alabama will allow me, I think everybody is confused about this term "experiment." The whole fixation of nitrogen from the air is in the empirical stage, the experimental stage, now. I agree with the Senator. Let us use the present development to its full capacity, and let them go on and experiment every day to improve it.

Mr. BLACK. That is correct.

Mr. SMITH. That is all I have contended for from the beginning; but let us not restrict them or bind them in a contract to any one process. This is the Government of the people of America; and we have no right to allow anyone to step in and say to what extent this Government will go in meeting a great economic problem or what method it will use to meet it.

I know there are individual rights that we must respect; but when an individual right runs counter to the life and prosperity of the vast majority of people, that individual right must be subordinate, or I do not understand our system of government.

Mr. BLACK. The Senator and I are in absolute accord. I believe in the operation of that plant to its full capacity. It will make 50,000 tons. Under the statement of the Senator from Nebraska [Mr. NORRIS] yesterday of what that nitrate would cost when fixed from the air, it would save the farmers of America who paid the same price that the Senator from Georgia [Mr. GEORGE] did $15,000,000. Therefore I agree with the Senator that we need legislation here which will run that plant or some other plant at its full capacity right away. We need a bill that will provide a sufficient appropriation to have

it run at full capacity, either by private operation or public operation. Personally I favor private operation, but if they will put in a bill or if they will accept the amendment which I have offered which provides for the full operation of some plant to produce this nitrogen that they say can be produced at from 4 to 5 cents a pound, when the farmer is paying from 15 to 19 cents a pound for it, then I will vote for the bill.

Mr. SMITH. Now, I want to make one concluding statement, so that my position will be thoroughly understood:

I am not wedded to Government operation, but I am wedded to Government operation at the present time, for the reason that I believe the Government would take a greater interest in bringing about the things that I want than a private corporation.

I believe that the Government, moreover, should hold it until it had done all the dead work necessary to make a theory a fact, an empiricism a working realization, and when it shall have done that, it will have also ascertained the cost and capacity, and when it comes to lease, if it wants to lease, it will know what it is leasing and the value of the lease to the lessor.

Mr. HOWELL. Does not the Senator believe that the synthetic process promises more?

Mr. SMITH. I have no more doubt about it than I have that the present-day automobile is far superior to the first attempt to apply the internal-combustion feature to transportation.

Mr. HOWELL. Then, so far as Muscle Shoals is concerned, the Senator would agree that if the energy is sold for money and the money used in the promotion of the development of the production of nitrogen, that would be as satisfactory as if the plant were used itself for that purpose.

Mr. SMITH. Taking human nature as it is, I would like to answer that in this way: The minds of the American people are concentrated on Muscle Shoals as a locus, as a place, where this thing is going to be done. The people who are familiar with the synthetic process say that the presence of cheap coal is essential not only for the production of power, but of certain ingredients that enter into the production of nitric acid, involving the use of technical terms of which I am not familiar, and which I would not use if I were, because we in this body are talking to the great mass of people, and we ought to try to speak in such language that they will know what we are driving at.

I would like to try the experiment at Muscle Shoals of producing nitrogen by the synthetic process for the reason that I believe that the nearness of the Tennessee coal would make it reasonably available for the process. I think the Senator will agree with me that the power generated from coal gases can be used in the production of ammonia. I believe we ought to take that cyanamide plant and run it to its capacity, under the auspices of the Government, to settle the question once for all as to whether it is an available source for producing nitrogen available for agricultural purposes direct to the agriculturists.

I believe we ought to scrap nitrate plant No. 1 because it was not constructed, to use a highly technical term, to properly synchronize in the synthetic process of extracting nitrogen, and therefore it was a failure. But let us erect right away a synthetic process at Muscle Shoals, bring down the coal from the Tennessee mines, or from the Alabama mines, and try it out, for the psychology of the thing, if nothing else.

Mr. President, I want to call attention to a very curious thing that has made me suspicious of a great many statements made even by the synthetic people and others. When I first introduced my bill on this subject many said, "You never can extract nitrogen from the air for agricultural purposes because the amount of power necessary to produce a unit of nitrogen makes the cost prohibitive." That was especially true, they said, of the arc process, the Norway and Sweden process. But they said not to produce nitrogen, but cyanamide, which is an indirect method of converting the nitric acid into ammonia; but even there it would take a vast amount of power, more than you could develop at Muscle Shoals if you proposed to make enough fertilizer to supply the needs of agriculture. They beat us off with that, that you could not develop enough power at Muscle Shoals under the process to make enough fertilizer to supply the country.

When the synthetic process has demonstrated that it takes only a small per cent of power as compared with these other processes, they say, "Why waste the power at Muscle Shoals? If you would use all the power down there, you would produce more fertilizer than America will need."

It is a question of—

I can and I can't,
I will and I won't;
I'll be damned if I do,
I'll be damned if I don't.

It is a thing for us to take hold of and do.

CALL OF THE ROLL

Mr. HAWES obtained the floor.

Mr. BLEASE. Mr. President, I suggest the absence of a quorum.

The PRESIDING OFFICER (Mr. TYSON in the chair). The clerk will call the roll.

The legislative clerk called the roll, and the following Senators answered to their names:

Barkley	Fess	La Follette	Robinson, Ark.
Bingham	Fletcher	McKellar	Sackett
Black	George	McMaster	Schall
Blease	Gerry	McNary	Sheppard
Bratton	Gould	Mayfield	Simmons
Brookhart	Hale	Neely	Smith
Broussard	Harris	Norbeck	Steiwer
Bruce	Harrison	Norris	Stephens
Capper	Hawes	Nye	Thomas
Caraway	Hayden	Oddie	Tyson
Copeland	Heflin	Overman	Walsh, Mass.
Curtis	Howell	Phipps	Walsh, Mont.
Cutting	Johnson	Pine	Warren
Deneen	Jones	Pittman	Waterman
Edge	Kendrick	Ransdell	Willis
Edwards	King	Reed, Pa.	

The PRESIDING OFFICER. Sixty-three Senators having answered to their names, there is a quorum present.

FLOOD CONTROL

Mr. HAWES. Mr. President, almost a year ago a great disaster visited our country. It involved the loss of some 200 lives, it made homeless 700,000 people, it destroyed over $250,000,000 worth of property. It would almost seem that we have forgotten that event, but at the time all through America meetings were held, petitions were sent to the President of the United States asking for a special session of Congress, and great conventions were called in different portions of our country, one of national import at Chicago. There the representatives of all the valley States requested the President to call a conference on this subject. That was last June. He was requested to call into that conference, which is the significant thing, not only the experts of the Government but civil engineers, conservationists, geologists, financiers, and agriculturists.

The Chicago conference adopted the following resolution:

Resolved, * * * That the President of the United States is requested to call a conference for the purpose of formulating, in conjunction with such governmental agencies, a comprehensive plan for navigation and permanent flood control. Said conference to be composed of Army engineers, civil engineers, conservationists, geologists, financiers, agriculturists, and other experts representing the various interests of our country.

That convention believed that the President should have the advice not only of Army engineers but of all elements of American life.

Even before the convening of Congress a committee of the House has been holding hearings beginning last November. They have continued since. Four or five volumes of testimony have been taken.

Before that committee appeared engineers, business men, and experts who understood the river and its needs.

On the Senate side hearings were held, some two weeks in length, and only recently a bill was reported to the Senate.

The significant thing is in all the hearings fully 95 per cent of the witnesses before the House committee opposed what was called the Jadwin plan, and the same percentage of those who appeared before the Senate committee opposed his plan, and yet the bill presented to the Senate provides for the adoption of the Jadwin plan.

I state here without fear of successful contradiction by any Senator that in the Senate hearings, with the exception of Colonel Jadwin himself and two of his assistants, all other witnesses condemned the Jadwin plan. In the shape that it comes before us, as a representative of the State of Missouri it can not receive my support.

Mr. President, this is a serious situation. As a friend of the river, born near the banks of the Ohio in Kentucky, growing up to manhood on the banks of the Mississippi in Missouri, watching the development of its navigation, I am amazed to find that in the month of March, 1928, we have only before us a plan that has been opposed by 95 per cent of the witnesses before the House and Senate committees. I shall discuss the Jadwin plan in detail later. Now, I direct the attention of the Senate to its national scope. I hope amendments will give us a flood-control plan that will meet with the approval of the representatives of the States in the valley.

THE RIVER

We can not visualize flood control unless there is clear understanding of the size of the drainage basin whose waters all pass through the alluvial delta and create the floods.

It is not the waters of the immediate States which are responsible for floods; it is the waters that come from States at a distance.

It may be said, in passing, that the greatest sufferer of all is Louisiana, and that practically all the rainfall in that State is carried to the Gulf through its bayous, creeks, and smaller rivers. The waters of this State do not enter the Mississippi nor contribute to the floods which overmaster the ingenuity of the people of Louisiana; and, in a degree, this is true of Arkansas, of Tennessee, of Mississippi, Kentucky, and Missouri.

All the waters flowing through this valley, no matter from what State or source it comes, must be taken into consideration in determining this problem. The entire rainfall between the western slopes of the Alleghenies and the eastern slope of the Rockies drains into this basin and passes through the area now under discussion on its way to the Gulf.

Before discussing the physical contact with some 31 States through its waterways, it may be interesting to briefly state some of its historical connections.

Even in colonial days the alluvial valley at the mouth of the river was the occasion of much diplomatic discussion between England, France, and Spain.

Washington sent three messages to Congress in the matter of the Mississippi River. The Louisiana Purchase was made by Jefferson largely because he believed it was essential to national unity that the Mississippi River should come into the possession and be made part of the United States. As far back as 1845 we find speeches from John C. Calhoun referring to the flood conditions of the previous year, which he then said were too great for local enterprise; that their control was a duty to be undertaken by the Federal Government.

Long before the wilderness was invaded by the pioneer the Spanish had the broad vision of the valley; the French had it; the English had it. George Washington, Andrew Jackson, and Abraham Lincoln all realized the importance of the river and had the broader view of the problem it presented.

It has always been accepted as a fact that a hostile army could never cross the Alleghenies on the east nor from the Rockies on the west. An invading army could find its way to the heart of America only up the river from its mouth or down the river from its source, and the Nation could not be conquered until this section had been subdued.

Jackson went down the river to the Battle of New Orleans, down the valley traveled the troops that helped Texas secure its freedom, and later again the troops that won the war with Mexico.

Modern authorities state that the real, decisive battles of the Civil War were fought upon its banks, and Union generals trained in the battles of the river were put in command on the eastern front, displacing the early opponents of General Lee.

The Mississippi watershed embraces 1,250,000 square miles, about 41 per cent of the total area of continental United States. Its watershed embraces 31 States and 2 Provinces of Canada.

It is not surprising, therefore, that President Garfield in 1878 said:

> The statesmen of America must grapple with the problem of this mighty stream. It is too vast for any State to handle, too much for any authority other than that of the Nation itself to manage.

But these are not the things in which we are interested to-day. What constitutes the Mississippi; whence come these flood waters? Whose problem is it? Whom does this river serve? How many does it serve? How many feel the weight of the misery it leaves in its wake when on a rampage? These things we must understand before we can move in legislative consideration.

If anyone were to say here to-day that the Mississippi River is a river more than 10,000 miles in length, there would be a tendency to question this geographical accuracy. But when we consider the whole facts for the purpose of flood control, we find that the Mississippi River is more than 10,000 miles in length; that it is probably twice that length; that no one has ever actually computed its real length, and that it is many times the largest body of flowing water in the entire world.

Sitting here in the Nation's Capital within 150 miles of the Atlantic seaboard, we can hardly realize that in the vast empire stretching to the west there is a gigantic watershed some 2,000 miles in width that is in fact drained by one great river. Not more than 200 miles west of the building in which we now are, the watershed of the Mississippi begins and then lays out across 2,000 miles until it meets the crags of the Rockies.

The waters of central West Virginia and the very western tip of Maryland flow off the Appalachian slopes into Ohio and Kentucky to ramble on through many States until at last they pass the levees at New Orleans to empty into the Gulf. Waters which ultimately become a part of the body of the Mississippi may be found above the northern borders of the United States in Canada, north and west of Montana.

Other water may be found a few miles from Lake Superior in Wisconsin, while still others—and this should be remembered by distinguished colleagues Senators COPELAND and WAGNER—may be found in the southwestern section of New York that pass the levees at New Orleans.

One who studies the map of the Mississippi Valley drained by the Mississippi River and its tributaries will be amazed. Every great river of the vast empire of the valley pours its waters into the Mississippi, and an accurate map of all these great rivers show hundreds of streams ranging from 50 to 200 miles in length paralleling each of them; rivers that run east and rivers that run west, and even rivers that run north.

I wonder how often it occurs to the residents of Montana that the Yellowstone coursing from the great national park north and east to its confluence with the Missouri ultimately drains its waters into the Gulf of Mexico.

How often do the residents of South Dakota, watching the Cheyenne flow north and east to the Missouri, realize that the waters that pass over their State rush on to become a part of the flood waters of the Mississippi?

There is the Little Missouri in North Dakota, that runs almost directly north toward Canada. And dropping to the southwestern section of the country we find the Tennessee wandering out of its own State into northern Alabama, then flowing almost directly north to the Ohio to carry its waters; first north, then south through the drainage basin of the Mississippi. And likewise, the Cumberland flowing first south from Kentucky across the northern section of Tennessee, then back north through Kentucky to the Ohio.

All along the great rivers which have become well known to us because of the consideration we have given to harbor problems in the past—the Ohio, the Red, the Arkansas, the Kansas, the Missouri, the Platte, the Atchafalaya, the Illinois, the Cheyenne, the White, the St. Francis—all along these rivers there are myriads of other streams running north, south, east, and west, pouring their waters into currents that sweep onward to New Orleans.

It is not fiction when we say that the Mississippi watershed touches 30 of the 48 States of this great Nation. The Mississippi River drains the far Northwest section skirting the boundary of Idaho. It drains all of Montana. It drains two-thirds of Wyoming. It drains one-half of Colorado and one-fourth of New Mexico. It drains one-third of North Dakota and all of South Dakota. It drains all of Nebraska, all of Kansas, all of Oklahoma, and the northwest strip of Texas.

Two-thirds of Minnesota's waters flow past New Orleans, all the waters of Iowa, all the waters of Missouri, all the waters of Arkansas, one-half of the waters of Wisconsin, all the waters of Illinois, and one-half of the waters of Mississippi.

This great river drains all the waters of Indiana, all the waters of Kentucky, all the waters of Tennessee, all the waters of Ohio, the western quarter of Pennsylvania, a small southwest corner of the State of New York, and the northern portion of Alabama.

Tributaries of the Mississippi reach into North Carolina, draining the southwest portion of Virginia, practically all of West Virginia, and reach almost to the Nation's Capital on the western edge of Maryland.

In addition to this, Chicago has cut a canal from Lake Michigan to the Illinois River, and it is difficult to determine how much of the waters of the Great Lakes are flowing past New Orleans. If we stop to consider for a moment the extent of this great empire, we are astounded at its size and its importance.

In this vast area served by this great natural water system are scores of the greatest cities of our Nation: Chicago, Pittsburgh, Wheeling, Columbus, Akron, Dayton, Cincinnati, Louisville, Nashville, Chattanooga, Paducah, Indianapolis, Decatur, Peoria, Memphis, Vicksburg, Milwaukee, St. Paul, Madison, Davenport, Des Moines, St. Louis, Kansas City, St. Joseph, Cape Girardeau, Sioux Falls, Fargo, Bismarck, Omaha, Lincoln, Topeka, Atchison, Arkansas City, Tulsa, Muskogee, Denison, New Orleans, Baton Rouge, Little Rock, Hot Springs, and many others.

There is hardly a city I have mentioned that does not expect at some future date to be the direct beneficiary of our river and harbor work which the Government of the United States has undertaken in connection with our great rivers.

This vast area of drainage is divided by engineers into six drainage basins, the first extending through portions of Virginia, North Carolina, Maryland, and Pennsylvania on the east and through the eastern section of Illinois on the west, taking in a portion of Ohio and the northern portion of Georgia and Alabama.

This is known as the Ohio drainage section. The upper Mississippi drainage section takes in the States of Illinois, Wisconsin, Minnesota, and a large portion of the State of Iowa.

The Missouri drainage extends from Montana and Idaho on the north and west in an irregular form down through portions of Colorado and Kansas, taking in the Dakotas, Nebraska, the western portion of Iowa, and Missouri.

The Arkansas drainage takes in the southeastern portion of Colorado, the northeast section of New Mexico, the northern strip of Texas, the southern portion of Kansas, all of Oklahoma and Arkansas, and all of the northern and eastern sections of Louisiana.

The lower Mississippi drainage basin is the area of Louisiana, Mississippi, Tennessee, Arkansas, and southeast Missouri, into which the water of all the other areas pour.

In this vast basin which we have described is an area of 1,240,000 square miles, or more than 41 per cent of the United States, not including Alaska. In this drainage area also may be counted 20,000 square miles of Canada. What might be called one river, the Mississippi from St. Louis to New Orleans, and the Missouri from its confluence above St. Louis to its source, is a continuous flow of water for 4,200 miles, a distance which is unequaled by any other river in the world and approached only by the Nile and the Amazon.

The Mississippi River from its source in Lake Itaska to its mouth is approximately 2,500 miles. A direct line from its source to its mouth would be approximately 1,300 miles.

The report of the Mississippi River Commission states that the navigable waterways of the Mississippi River and its tributaries is estimated at 15,000 miles, so that including other waters than navigable waters the total length of the flood waters of the Mississippi may well be placed between twenty and twenty-five thousand miles—a river which, if extended into one stream, would reach around the entire globe at the equator.

Now, let us turn to the valley which this vast waterway system drains—a valley that is an empire of wealth in itself, self-sustaining in its raw and manufactured products, and raising on its fields more than two-thirds of the agricultural products of the Nation, manufacturing in its plants one-half of the products of the whole of America.

In the Mississippi Valley live more than one-half of the entire population of the United States. The valley contributes to the national wealth 68 per cent of the exportable products. In the valley is the industrial center of the Nation, the agricultural center near the confluence of the Mississippi and Illinois Rivers, and the center of population in southwestern Indiana near the Illinois line.

At least four mountain areas are embraced within the boundaries of the valley. There are forests and plains, thinly populated but teemingly productive flat lands. And then, again, great congested commercial centers. Although housing slightly more than one-half of the population of the Nation, the valley is inhabited by 70 per cent of the rural population.

In the Mississippi Valley all but 15 per cent of the entire corn output of the Nation is grown; 80 per cent of the Nation's wheat yield is found; practically all of the rye, barley, flaxseed, sugar cane, and oats are raised in the valley on its 295,000,000 acres. The potential productive wealth is incalculable. Its stock is about three-fourths of the total livestock of the Nation.

Producing more than one-half of the manufactured products of the United States, this great area turns out the agricultural implements of the world, 90 per cent of the automobiles, one-half of the brick and terra cotta, one-third of the leather, two-thirds of the wood, one-half of the furniture, one-half of the glass, and practically all of the iron and steel work, to say nothing of a practical monopoly in the output of coal, coke, and iron ore.

The drainage basin of the Mississippi is larger than the area of the whole of continental Europe. It is the world's most precious area. Its development in less than 100 years is probably the most remarkable chapter in this history of national growth.

FLOODS

The waters of Montana and the waters of Pennsylvania join with the waters of northern Wisconsin and those of Virginia and New Mexico at some point of the basin along the lower Mississippi and contribute to the causes of floods.

There are records of floods in 1828, 1844, 1849, 1850, 1858, 1862, 1882, 1883, 1890, 1892, 1893, 1897, 1903, 1912, 1913, 1916, 1922, and 1927. So there has been a continuous struggle with the problem for 100 years, first by the States and subdivisions of the States and later with Federal assistance. This Federal assistance has been increasing, but without success. So precedent must be set aside and the Nation take the problem fully in hand and solve it as a national problem at national expense.

These floods are naturally characteristic of the vast basin with its tilted-up northern section and its tilted eastern and western borders all hurling its waters into the narrow strip of the lower Mississippi. The early settlers along the banks of the lower Mississippi saw the necessity for controlling the floods. They built makeshift levees along the river banks, and as the pioneer population swept into the valley dikes and levees were constructed by these first pioneers.

The first efforts were individual efforts and then, through a community spirit, by organized districts. One by one the States, as they grew up and became a part of the United States, undertook some form of legislation with respect to these floods; but it was a hopeless task for any State or group of States. It is manifest from the picture of this great drainage basin that no one section and no one State can handle the flood problem. These floods are not caused alone by the act of God, by the deposit of snow and rain, but in recent years they have been contributed to by the act of man, and this contribution by man is constantly increasing.

The millions spent annually on good roads are constantly forming drainage systems which carry water with an increased velocity to the basin. Drainage systems add to this velocity. Forests have been denuded which held back in restraint the quick flow of rain water. Swamp lands have been converted into farms, and the natural provisions of nature for holding back the waters have been destroyed. I am not discussing the lower valley now, which is in immediate distress. This artificial precipitation comes from above that district, beyond its reach and control.

The people of the alluvial valley made their fight against these floods, without assistance from the Government, until 1882, when it became apparent to everyone that the States and local subdivisions could not handle the matter without national assistance. Since that time the policy of Congress has been to constantly enlarge its contribution, and there has been a corresponding acknowledgment by Congress of the national responsibility.

From 1714 until the creation of the Mississippi River Commission in 1879 the entire expense of the fight against the floods was borne by the States and local subdivisions. Immediately upon Federal participation came absolute Federal control. To-day a private citizen can not build a boat, a dike, a bridge, a dam, or revetment without permission from the National Government. Its authority is supreme; its control absolute. Yet under this Federal control and direction this territory has lost in floods, in 1903, $40,000,000; in 1912, $78,000,000; in 1913, $12,000,000; in 1916, $5,500,000; in 1922, $17,000,000; and in 1927 between $236,000,000 and $284,000,000. This shows a total loss of over $400,000,000 in less than 25 years in a district which is now under the direction, control, and mandate of the Federal Government so far as flood matters are concerned.

To prevent this great loss the States had spent $292,000,000, while Congress had contributed only $71,000,000, leaving a difference of $221,000,000.

The whole theory of local contribution and dual responsibility is illogical, unsound, and impossible of equitable application. The only argument in its favor is precedent, and the precedent is unsound because there has been a change in conditions and a recent frightful demonstration which has destroyed the precedent.

Local contributions can not be equitably imposed. The contribution of the States is not uniform. The attempt to make Missouri pay for Illinois, or Kentucky to contribute to Tennessee, or Arkansas to Louisiana, can not be worked out on any equitable basis, and finally leaves the vast burden to be borne by Louisiana, when, as a matter of fact, the cost to Louisiana is of benefit not only to all the adjacent States but to the entire valley.

It has been stated that flood control is a reclamation matter; that it confers special benefits to special landowners and should be paid for by them. No one who has investigated the subject ever made such claim. It is merely an ignorant assumption unsupported by facts.

The losses in seven States amounted to $236,344,414.06. I give this in itemized form so that some idea of the diversity of the damage may be understood.

Report of loss and damage by the 1927 floods in the Mississippi Valley in the States of Illinois, Missouri, Kentucky, Tennessee, Arkansas, Mississippi, and Louisiana

(Acres of crop land flooded in five States, 4,002,400. No report on number of acres flooded in Illinois and Kentucky.)

Crop losses:			
Baled cotton damaged		$2,828,850.00	
Loss on average crop expected		16,028,024.00	
Loss of rents on lands not cultivated by reason of overflow		12,190,300.00	
Damage to growing cotton crop		13,497,237.00	
Damage to sugar industry (report furnished by American Sugar Cane League)	$7,080,000.00		
Cost to replant 34,000 acres of cane	3,400,000.00		
		10,480,000.00	
Damage to growing crops other than cotton and sugar		15,679,950.00	
Damage to matured crops		2,083,260.00	
Damage to seed		753,419.00	
			$73,541,040.00
Cost of replanting			4,181,627.00
Livestock losses:			
12,626 horses and mules		1,269,150.00	
2 counties in Missouri report livestock losses without giving number		45,000.00	
25,716 cattle		633,075.00	
133,174 hogs		1,153,929.00	
2,560 sheep and goats		10,615.00	
719,647 poultry		388,723.30	
			3,500,492.30
Property damage:			
7,879 houses destroyed		3,341,650.00	
46,840 houses damaged	$6,724,625.00		
2,200 houses destroyed or damaged (Arkansas)	570,000.00		
9,904 houses, stores, gins, barns, and other buildings destroyed or damaged	1,535,750.00		
Houses destroyed or damaged, no number given (Louisiana)	50,000.00		
Houses, stores, gins, barns, and other buildings destroyed or damaged	3,601,562.00		
		12,481,937.00	
118 stores destroyed	87,600.00		
Stores destroyed or damaged, no number given (Illinois)	3,000.00		
		90,600.00	
2,138 stores damaged	625,150.00		
10 stores destroyed or damaged (Arkansas)	10,000.00		
Stores destroyed or damaged, no number given (Louisiana)	5,000.00		
		640,150.00	
17 gins destroyed		118,000.00	
235 gins damaged		197,650.00	
2,997 barns destroyed		791,650.00	
11,594 barns damaged	$888,710.00		
400 barns destroyed or damaged (Arkansas)	160,000.00		
Barns destroyed or damaged, no number given	134,500.00		
		$1,183,210.00	
16,971 other buildings destroyed		1,570,800.00	
36,523 other buildings damaged	$941,220.00		
200 other buildings destroyed or damaged (Arkansas)	20,000.00		
Other buildings destroyed or damaged, no number given	96,500.00		
		1,057,720.00	
Damage to merchandise		1,628,711.00	
Damage to oil mills		528,000.00	
Damage to farm implements		1,317,515.00	
Damage to automobiles		1,003,650.00	
Damage to feed		3,054,544.50	
Damage to household goods		4,730,627.00	
Damage to land by washing and spreading of obnoxious grasses		4,736,750.00	
Damage to fences		964,625.00	
Damage to private roads and bridges		1,211,850.00	
Damage to private ditches and drains		840,350.00	
			$41,489,999.50
Business losses			18,655,515.00
Damage to school buildings and equipment			399,841.29
Damage to hardwood lumber industry			4,474,820.00
Damage to cooperage industry			258,952.00
Damage to highways and bridges			2,738,122.00
Damage to railroads			16,702,379.51
Damage to public utilities			718,835.00
Cost of high water fight:			
Mississippi River Commission		$6,000,000.00	
Levee boards		2,120,084.26	
Board of Engineers (Louisiana)		250,000.00	
			8,370,084.26
Closing crevasses (Mississippi River Commission)			3,578,000.00
Restoring levees to preflood condition			2,575,566.20
Damage, Caernarvon Crevasse			5,000,000.00
Damage, junior crevasse			350,000.00
War Department supplies furnished			7,000,000.00
Red Cross fund		$16,000,000.00	
Appropriated by the State of Illinois for relief		2,000,000.00	
			18,000,000.00
Loss of earnings of tenants and share croppers, average 137,773 people at $20 per month, on a basis of 9 months' working season			24,799,140.00
Total			236,334,414.06

Number of lives lost, 183.

The railroads alone suffered a loss of $16,702,379.51, as follows:

Loss and damage to railroads by reason of the 1927 floods in the Mississippi Valley

Missouri-Kansas-Texas Railroad Co.
St. Louis-Southwestern Railway Co.
St. Louis & San Francisco Railway Co.
Chicago, Rock Island & Pacific Railroad Co.
Louisiana Railway & Navigation Co.
Texas & Pacific Railway Co.
Illinois Central system.
Louisiana & Arkansas Railway Co.
Missouri Pacific Railway Co.
Gulf Coast Lines.
Missouri & North Arkansas Railway Co.

Eleven companies report as follows:

Expense of keeping line open	$2,022,972.09		
Cost of repairing roadbed damaged by high water	4,349,809.12		
Damage to equipment	253,989.69		
Damage to shipments in transit	212,314.00		
Expense of handling Red Cross supplies	329,812.67		
Expense of handling refugees	$143,982.60		
Expense in connection with providing box cars for living quarters of refugees	160,719.00		
Loss of business during high water (Due to damage to crops, logging operations, manufacture, etc., freight and passenger business.)	7,185,720.94		
Direct loss			$14,659,320.11
Four companies report loss of business account diverted to other lines during high water (business which did not return after high water receded)	612,118.40		
Loss due to decrease in efficiency of operation and efficiency of personnel	27,500.00		
Freight and passenger business which did not move due to erroneous information given out in various parts of the country concerning flood conditions and their effect on the transportation lines	208,500.00		
Miscellaneous expense (6 companies)	1,194,941.00		
Indirect loss			2,043,059.40
Total loss			16,702,379.51

The utility companies lost $718,835, as follows:

Loss and damage to public utilities by reason of the 1927 floods in the Mississippi Valley

STATE OF ILLINOIS		
Illinois Bell Telephone & Telegraph Co		$12,000
STATE OF KENTUCKY		
Southern Bell Telephone & Telegraph Co		5,000
STATE OF ARKANSAS		
Southwestern Bell Telephone & Telegraph Co	$32,000	
Postal Telegraph & Cable Co	11,250	
		43,250
STATE OF MISSISSIPPI		
Southern Bell Telephone & Telegraph Co	150,000	
Postal Telegraph & Cable Co	18,750	
		168,750
STATE OF LOUISIANA		
Southern Bell Telephone & Telegraph Co	$86,500	
Postal Telegraph & Cable Co	5,000	
		$91,500
Western Union Telegraph Co., loss and damage in the seven States		98,335
American Bell Telephone & Telegraph Co., reports loss of business		300,000
Total damage		718,835

As another illustration disproving the claim that this is a reclamation project, I give the losses in Missouri as typical in character of the losses in other States:

STATE OF MISSOURI

Loss and damage by reason of the 1927 floods in the Mississippi Valley—Nine counties affected

Crop losses—310,000 acres of crop land flooded:			
Baled cotton damaged		$7,500	
Loss of rents on lands not cultivated by reason of overflow		1,786,400	
Damage to growing cotton crop		290,000	
Damage to other growing crops		3,140,500	
Damage to matured crops		420,260	
Damage to seed		66,800	
			$5,711,460
Cost of replanting			55,000
Losses of livestock:			
108 horses and mules	$10,800		
Horses, mules, cattle, hogs, and poultry (Dunklin and Pemiscot Counties, no number given)	45,000		
		55,800	
148 cattle		4,150	
1,280 hogs		22,300	
700 poultry		250	
			82,500
Property damage:			
136 houses destroyed		60,000	
1,814 houses damaged	97,000		
479 houses, stores, gins, barns, and other buildings destroyed and damaged (Dunklin County)	40,250		
Houses, stores, gins, barns, and other buildings destroyed and damaged (Pemiscot County, no number given)	40,000		
		177,250	
1 store destroyed		1,000	
20 stores damaged		4,000	
2 gins damaged		1,600	
38 barns destroyed		15,000	
55 barns damaged	6,400		
Barns and other buildings destroyed and damaged (Stoddard County, no number given)	21,000		
		27,400	
40 other buildings damaged		2,000	
Damage to merchandise		20,000	
Damage to farm implements		16,200	
Damage to automobiles		6,500	
Damage to feed		254,000	
Damage to household goods		38,750	
Damage to land by washing and spreading of obnoxious grasses		55,000	
Damage to fences		121,000	
(Two counties report 210 miles damaged.)			
(One county reports without giving number of miles.)			
Damage to private roads and bridges		82,500	
Damage to private ditches and drains		122,500	
			1,004,700
Business losses			250,000
Hardwood lumber industry, 10 mills affected			136,820
Damage to school buildings and equipment			74,378
Damage to highways and bridges			376,407
Total damage			7,691,265

The testimony of the witnesses before the House and Senate committees will be illuminating. Read the testimony of Postmaster General Harry New on the number of post offices closed, the interruption and suspension of mails, the closing of schools, the idleness of school children. Read the statements of the presidents of the great transcontinental railroads, together with their chiefs of engineers. Read the testimony of bankers and investment houses. Read of the interruption of commerce and the loss which affected not only the immediate community but the entire United States.

Other Senators may illustrate the losses in their own community. I have given the Missouri losses, which are relatively small considering the large total, and this loss was created because of one break in a long line of levees. It came from one crevasse, and that levee was under the control and management of the Federal Government.

We find in the last analysis that $292,000,000 was spent by the States, only $71,000,000 by the National Government, or a total of $366,000,000; that the total losses from floods was over $400,000,000; and now we are quibbling as to the contribution for levees and other forms of construction which will not involve over $12,000,000.

Suppose we have another flood next year with another $250,000,000 loss? If it does not come next year, it is certain to come in some succeeding year. What answer will these contenders for local contribution be able to make to another great national disaster?

We have handled the matter of floods in an unbusinesslike manner. We have paid the cost for national neglect, and we will have to pay it again and again and again until such time as the Army engineer is permited to have a broader vision, more humanity, to a time when self-contemplation and pride of personal opinion will give place to an adequate plan before an aroused and outraged national public sentiment.

If the losses in this region and the failure of local effort do not tell their own story, no words of mine can add to the facts or be persuasive. These figures give the lie to fiction. They demonstrate that flood control is a national problem. If the waters that flow from more than 40 per cent of the area of the Nation in which live more than 50 per cent of the population, and 70 per cent of our agricultural population, do not constitute a national problem when at flood stage, then, it seems to me, that we have no national problem with which to deal.

This is not a new problem. It has been merely emphasized by the losses of the recent flood. For a century the minds of thoughtful men have turned to this question of controlling the floods of the Mississippi.

NATIONAL PROBLEM

Men from all classes of life, engineers of experience, business men of standing, and representatives of various organized groups, have appeared before both the House and Senate committees. They have almost uniformly, with the exception of General Jadwin and some of his immediate associates, contended that this was a national problem to be borne by national expense. They have shown the futility of asking local contribution, the injustice of it, its inhumanity considering the terrible losses recently suffered, and how it can not be compelled by the National Government. They have shown that where the chain breaks in one part it destroys the whole machinery of protection.

It may be well, however, in passing to quote a few of these witnesses:

The representatives of the chamber of commerce, the great national business organization.

The representatives of the American Federation of Labor.

The representatives of the American Legion.

The representatives of farm bureaus.

The American Chamber of Commerce, representing the business men of every State in the Union, submitted to its membership, by referendum, two resolutions for their consideration:

First, the committee recommends that the Federal Government should hereafter pay the entire cost of constructing and maintaining works necessary to control floods of the lower Mississippi.

The vote in favor was 2,131; votes opposed, 512.

Proposition No. 2:

The committee recommends that the Federal Government should assume the sole responsibility for locating, constructing, and maintaining such works.

Votes in favor were 2,581; votes opposed, 240.

The committee from this organization made a personal trip of investigation, held hearings, took with them their own engineers and experts, and arrived at their conclusions only after thoughtful consideration and first-hand information.

On this committee were representatives of citizens from Washington, D. C., from California, from Illinois, from Arkansas, from Tennessee, from New York, from Missouri, from Wisconsin, from Mississippi, and various sections of the country.

For the information of the Senate, I ask permission to insert in the RECORD, in the body of my remarks, some description of these men, their past experience, and ability to pass judgment on so vital a matter.

The PRESIDING OFFICER (Mr. SHEPPARD in the chair). Is there objection?

There being no objection, the matter was ordered to be printed in the RECORD, as follows:

PERSONNEL OF NATIONAL CHAMBER'S COMMITTEE ON FLOOD CONTROL OF THE MISSISSIPPI

Frederic A. Delano, chairman, Hibbs Building, Washington, D. C.: Formerly a railroad executive and president of the Wabash Railroad; appointed a member of the Federal Reserve Board upon establishment of the Federal reserve system, resigning in 1918 to enter Army; on staff of the director general of transportation in France; member National War Savings Committee, Treasury Department, during war; recently receiver for the United States Supreme Court in Red River boundary case; member national chamber's committee on inland waterways, 1922–23; ex-member board of overseers of Harvard; ex-trustee University of Chicago; member American Society Civil Engineers, American Institute Mining Engineers, Western Society Engineers, A. A. A. S., American Railway Association, Franklin Institute, International Railway Congress; Western Railway Club, Chicago.

Robert P. Lamont, vice chairman, 410 North Michigan Avenue, Chicago, Ill.: Manufacturer, of Chicago; president American Steel Foundries; director First National Bank of Chicago, Armour & Co., etc.; during war chief procurement division, Ordnance Department; honorary vice president National Foreign Trade Council Convention, 1919; member Chicago Association of Commerce and formerly vice president Illinois Manufacturers' Association; director Chamber of Commerce of the United States.

Arthur S. Bent, 418 South Pecan Street, Los Angeles, Calif.: Engineering contractor, of Los Angeles, Calif.; senior partner Bent Bros. and president California Glazed Cement Pipe Co.; formerly president Associated General Contractors of America; director Chamber of Commerce of the United States; trustee Pomona College (Claremont, Calif.); director, 1923, Merchants and Manufacturers' Association; American Concrete Institute, affiliated American Society of Civil Engineers.

William Butterworth, Deere & Co., Moline, Ill.: Manufacturer, of Moline, Ill.; president Deere & Co.; formerly president National Implement and Vehicle Association; chairman Army vehicles, General Munitions Board, Council National Defense; chairman subcommittee on Army vehicles, General Munitions Board, Council National Defense; member American Committee of the International Chamber; vice president of the Chamber of Commerce of the United States for the Northern Central States.

H. C. Couch: Engineer, of Pine Bluff, Ark.; president Arkansas Light & Power Co.; vice president Bankers Trust Co., Little Rock, Ark.; chairman Arkansas Farm Credit Co.; national counselor for Pine Bluff Chamber of Commerce in United States Chamber of Commerce.

Jacob M. Dickinson: Lawyer, of Chicago; formerly Secretary of War; president of the American Bar Association; receiver for Rock Island lines, etc.; vice president American Society of International Law; president Izaak Walton League.

Robert R. Ellis, 155 South Front Street, Memphis, Tenn.: Wholesale merchant, of Memphis, Tenn.; president the Hessig-Ellis Drug Co.; formerly president Memphis Chamber of Commerce; vice president of the Chamber of Commerce of the United States; director Central-State National Bank, of Memphis.

Walker D. Hines, 320 Broadway, New York, N. Y.: Lawyer, of New York City; president Cotton Textile Institute; formerly chairman board of directors Atchison, Topeka & Santa Fe Railroad; formerly Director General of Railroads; author of numerous pamphlets and articles governing railroad problems, especially those connected with Government regulation and railway and international affairs since the war; recently arbitrator under peace treaties of questions relating to river shipping and investigator under League of Nations respecting navigation on Rhine and Danube.

John G. Lonsdale, National Bank of Commerce, St. Louis, Mo.: Banker, of St. Louis, Mo.; president of the National Bank of Commerce, St. Louis; director St. Louis Reserve Bank; member commerce and marine committee of the American Bankers' Association; chairman production bureau committee St. Louis Chamber (committee interested, among other things, in rural educational facilities; secured cooperation of school superintendents throughout the State in making a survey of rural educational facilities, which committee used in industry and educational campaign for their improvement, etc.), 1920–21; member of national chamber's committee on education, 1921, 1922, and 1923; member of board of directors St. Louis Chamber of Commerce, 1921; member of Business Men's Agricultural Commission, 1926 (Chamber of Commerce, United States of America, and National Industrial Conference Board); chairman national chamber's committee on aeronautics, 1926–27, 1927–28; member committee on banking and currency study, 1927–28; director representing finance department Chamber of Commerce of the United States.

Daniel W. Mead, 115 South Carroll Street, Madison, Wis.: Engineer, of Madison, Wis.; professor of hydraulic and sanitary engineering, University of Wisconsin, and consulting engineer in these fields; built waterworks for Rockford, Fort Worth, Tex., Danville, Ill., Moline, Ill.; filter, Kilbourn, Wis., hydraulic-electric plant (10,000 horsepower); Prairie du Sac, Wis., hydraulic-electric plant (20,000 horsepower); author, "Notes on hydrology," 1904; "Water-power engineering," 1908; "Contracts, specifications, and engineering relations," 1916; also numerous papers read before scientific societies and bulletins of University of Wisconsin; member of the former Red Cross commission to China on flood protection; and formerly consulting engineer Miami conservancy district.

John M. Parker: Cotton planter and cotton merchant, of New Orleans; former Governor of Louisiana; formerly president New Orleans Board of Trade, Mississippi Valley Association.

Leroy Percy, Weinberg Building, Greenville, Miss.: Lawyer and cotton planter, of Greenville, Miss.; former Senator of the United States; director of St. Louis Federal Reserve Bank; attorney for First National Bank; Yazoo & Mississippi Railroad; director, First National Bank of Greenville, Miss.

Matthew S. Sloan, 380 Pearl Street, New York, N. Y.: Engineer, of Brooklyn, N. Y.; president Brooklyn Edison Co.; member American Institute of Electrical Engineers; treasurer and trustee Polytechnic Institute of Brooklyn; trustee Brooklyn Hospital; member American Institute for Electrical Engineers, New York; Electrical Society, Academy of Political Science; director Brooklyn Chamber of Commerce; director representing natural resources department, Chamber of Commerce of the United States.

Alfred H. Stone, Dunleith Plantations, Dunleith, Miss.: Cotton planter, of Dunleith, Miss.; vice president Staple Cotton Cooperative Association; member Mississippi Legislature, 1916–1923; American Political Science Association; American Sociological Society; American Historical Association; American Economic Association; African Society of London; president Mississippi Historical Society, 1912–13; author, Studies in the American Race Problem, 1906; editor, the Staple Cotton Review.

Mr. HAWES. Mr. President, Mr. William Green, the president of the American Federation of Labor, in a letter addressed to me on February 18, makes this statement:

The officers and members of the American Federation of Labor believe that the cost of flood control in the Mississippi Valley should be borne by the Federal Government. The task is so great and the problem so complicated and difficult that it seems that the Federal Government is the proper agency to undertake and complete this great enterprise.

Mr. Wallace, representing the American Federation of Labor:

To tell those people that they must pay part would in effect do two things: First, it would delay the securing of the banks of the river, or whichever way the engineers might think it is necessary to control the flood waters. Secondly, it might bring about controversies between States, between localities, as to how this work should be done. Surely if they are asked to help pay they will demand some voice as to how this work shall be done. If this work is to be done well and to be done thoroughly, in our opinion, it should be controlled by one head, and therefore financed by that same head.

The representatives of the National Association of Credit Men, with a membership of 30,000 and with headquarters in New York, Chicago, and San Francisco, made this interesting statement:

That the influence of these disasters, while it is felt immediately by those in the vicinity where they occur, is causing untold thousands of dollars' loss of property and loss of lives, and suffering does not stop there. It spreads out through the channels of trade and commerce and business and economic conditions throughout our entire Nation. It is a national problem. It must and should be controlled.

Mr. Frederic Delano, chairman of the special committee studying this problem for the National Chamber of Commerce, made this statement:

As it is a national problem, it is one for the National Government to finance in its entirety. The people in the flooded areas have exhausted themselves in their unavailable efforts to protect themselves. They are at the end of their resources.

Mr. James E. Spofford, national commander of the American Legion, presented the following resolution from the Legion:

That legislation should be enacted by the Congress of the United States not only to grant relief in the present disaster but to provide against the recurrence of these floods, and finally to solve the problem of flood control particularly through the Mississippi River Basin.

Independently of this portion of this resolution, Mr. Spofford made this statement:

It is the Government's business to see that it is done. The Government has no authority, that I know of, to force the States to do anything on that line; and, therefore, if the States refuse, I should say the Government would have, under that resolution, to carry it out at Government expense.

* * * * * * *

Everybody has a local idea, but in the Legion, with people who have seen service for their country, there is something that goes beyond a local position, and a man gets a national view of it as well.

Southern States Republican League, represented by John Stephen Sewell:

Whereas these floods have been greatly accelerated and increased in recent years by the reclamation of tremendous areas of swamp lands in the north which formerly acted as natural reservoirs, and by the tilling and draining of millions of acres of farm lands which were a natural sponge to hold back flood waters, * * * the Federal Government should hereafter pay the entire cost of constructing and maintaining works necessary to control floods of the lower Mississippi Valley.

Representatives of the Investment Bankers' Association and others testified to the impossibility of further local contributions, failure to pay interest on bonds, the inability to pay, and the general state of demoralization which exists and which will continue to exist until the National Government performs its full duty. There is general agreement that there can be no further local contribution. The levee districts which have made these contributions in the past have been bled white.

During the absence of the President, he selected as his personal representative and to act for him in the flooded district Mr. Herbert Hoover, Secretary of Commerce.

Mr. Hoover spent considerable time in the district during the flood, visited many portions of the river, and made a great many speeches, some at banquets, some at meeting places, some over the radio, and accompanied by newspaper interviews.

There can be no doubt from these statements that at that time the Secretary believed this to be a national problem, to be executed without delay, to be paid for by the United States Government without contribution from the local States.

At Memphis, on April 30, over the radio:

A week ago when it broke the levee at Stops Landing only a quarter of the river went through the hole, yet in a week it poured water up to 20 feet deep over several counties, an area up to 150 miles wide, and flooding 150,000 people. The crest of this great collection of water from 30 States moved slowly down the river 30 or 40 miles an hour.

Same speech:

To-day some 3,000 are homeless in each of Illinois, Kentucky, and Tennessee, 20,000 or 30,000 in the State of Missouri, 120,000 are flooded in Arkansas, and 150,000 in Mississippi.

Same speech:

No man can charge the fate of these unfortunate people to any failure upon their part.

At St. Louis, May 8, Raymond P. Brandt said:

The next step may be the request for appropriations. I shall do whatever I can to help in this work. I will gladly go before the House and Senate committees to give my views on the necessity of appropriations for the surveys or the actual work. If necessary, I will make speeches to arouse public sentiment. As a matter of fact, public sentiment is already aroused on this question of flood control, and I do not expect there will be any trouble over appropriations this session.

I quote from an interview with the brilliant reporter of the New York Times, Mr. Speers, on May 22:

Given the money necessary, there is a solution for every engineering problem, and no matter what the cost of flood control, it will not be nearly so much as the loss suffered as the result of this flood, which has devastated so many hundreds of thousands of acres of the most fertile land on earth and rendered hundreds of thousands of good citizens homeless and destitute.

The Mississippi has been here a long time, it has a flood every spring and sometimes a superflood like this one.

* * * * * * *

We must give these people security and not permit them to live in peril. And it can be done for a whole lot less than we have lost in this flood. I expect to see brought forward a perfectly competent, workable plan of Mississippi flood control. It is a magnificent problem and it can and will be, I am convinced, solved in a magnificent and thoroughly American way.

In a speech in Louisiana, May 23, Mr. Hoover said:

And I wish to say in conclusion that I have now spent five weeks in your midst. I have had an opportunity to witness the fine spirit and cooperation of the communities, the able leadership and courage of the citizens of your State, and all of your sister States who have participated in this calamity. I have seen the gratitude of your people for the effort made by the Nation under the leadership of the President of the United States. I have acted as his representative and, in doing so, I have been but giving evidence of the President's desire and the desire of the people of America to do not only their duty but to cooperate in generous spirit to remedy a calamity that was no fault of your people.

In Chicago on June 4, the Chronicle reports him as saying:

God has blessed our country greatly in resources and wealth. We number our possessions in hundreds of billions. These people are our own citizens. Their fate is not due to any fault or failure on their part. They are carrying burdens which outweigh our assistance manyfold. We of the North have the right and the duty to bind their wounds because they are of our own country.

I quote from a speech at Monroe, La., June 8:

There is one bright ray which comes out of the gloomy situation confronting the Mississippi Valley. It is the realization that the 125,000,000 people in the United States have awakened to the fact that this valley must be protected from future catastrophe. When Congress convenes to take up the flood problem, I am certain that the question will be settled for all time and that the future prosperity and growth of the valley will be guaranteed. All that you need down here to make your success complete is a sense of security. I am willing to guarantee you right here and now that the sense of security will be forthcoming within the next 8 or 10 months.

Statement by Herbert Hoover, Washington Star, June 12:

What it all means in human terms is simple enough, 750,000 people flooded, 600,000 driven from their homes or made dependent upon relief.

No one can at present calculate accurately the economic loss. It will probably run from $200,000,000 to $400,000,000. That 1,500,000 of our countrymen should continue to live in such jeopardy is unthinkable, nor can the Nation afford to abandon to disease-producing mosquito swamps 20,000,000 acres of its richest lands, an area nearly as large as the State of Indiana. This flood has been the greatest disaster of peace times in our history, but what will it be if we have 10,000,000 of our people living in such jeopardy instead of 1,500,000?

* * * * * * *

All the engineering plans for flood control of the river must, of course, be revised in the light of their experience, and they must be revised as against any combination of floods from the tributaries.

* * * * * * *

The main thing is a plan bold and strong enough to deal with the question in finality, for we have to live with this river for thousands of years yet.

* * * * * * *

I am convinced that our engineers can develop plans which will control the floods. I believe we can give security to the people living below the levees that will permit the full development of these plans and their full growth in population.

Washington Star, June 12:

I have no doubt that within the next few months there will be worked out a plan of flood control that will permanently relieve the Mississippi Valley of all fear of future disaster; I am convinced the American people are going to see that this plan is to be put into effect at once.

New Orleans, June 18, Washington Star:

In human terms, this Mississippi River flood of 1927 means 750,000 people flooded, 600,000 driven from their homes or made dependent upon relief. The economic loss will probably run from $200,000,000 to $400,000,000. That 1,500,000 of our countrymen should continue to live in such jeopardy is unthinkable.

New Orleans, June 29:

"Assumption by the Nation of its responsibility for prevention of future floods," said Secretary Hoover in discussing the present flood situation, "is one benefit that will result from the present disaster. With this flood menace removed," he added, "the economic development of the flood plain of the Mississippi will be such that the present population of 1,800,000 will be increased to from 5,000,000 to 10,000,000 in the next quarter of a century."

Speech at Little Rock June 25:

This great catastrophe by which a million and a half people in this valley have been brought in jeopardy, by which hundreds of thousands have been driven from their home, is not all a loss. It has served to educate the whole people of the United States to a great problem of elemental importance to the progress of our country and the prosperity of our State. That is the necessity for complete and whole control of the Mississippi River. I believe the sentiment of the Nation to-day is unanimous in that it should be taken in hand in such fashion as to give a complete assurance that, in the words of President Coolidge, "It will not happen again." And it is a national problem. Not only does the lower Mississippi River serve as a trough to carry off the flood waters of 32 States, but in the great flood plain of the Mississippi

we possess one of the Nation's greatest assets of 20,000,000 acres of its richest lands.

* * * * * * *

Nor can we as a Nation tolerate periodic destruction and shock which come from a repetition of catastrophes such as this. Every great loss of this kind reechoes throughout the whole Nation. No matter how small it be, every citizen is deducted something from his wage or income toward such loss as this.

* * * * * * *

Nor can the cost of flood control fall upon the people who are now prostrated by inadequate measures of the past and who bear the burdens of losses which will require years for recovery.

* * * * * * *

Adequate flood control therefore becomes a national problem. One of the first obligations upon Congress is to authorize a complete and not a partial solution and to provide funds for its execution.

Executive Office, Rapid City, S. Dak., July 21:

It is not incompatible with national economy to prevent $10 of economic loss by the expenditure of $1 Federal outlay. In the face of their great losses and their present destitution, I do not see how the people along the river can contribute much more than the maintenance of the central works after they have been constructed.

Mr. President, the Jadwin plan as presented to the Senate in the Jones bill does not solve the problem. It was a plan that was repudiated by 95 per cent of the witnesses before the House committee, by practically every witness before the Senate committee.

All through the hearings we were asked to provide a place for the civil engineer, and we find the Chief of Engineers, General Jadwin, asking that the civilian engineer be pushed further back. This is a subject upon which I will not now detain the Senate, but I hope I have said some things which may impress upon the Senate the fact that this subject must be considered as a national problem, that local communities in the States are unable to handle it properly, and that there is unanimity of opinion among the great business organizations, the great labor organizations, the farm organizations, the American Legion, and the great newspapers of the Nation, that this is a national problem, to be paid for wholly and exclusively by the Nation.

Twenty thousand civilian engineers are being graduated from 48 State colleges and other special colleges, such men as served under General Jadwin in the war, 75 of them from my own city of St. Louis having left places of high profit to serve in the war, and on any commission that decides any vital question of flood control adequate representatives of this body of trained civilian engineers should be provided for.

MUSCLE SHOALS

The Senate, as in Committee of the Whole, resumed the consideration of the joint resolution (S. J. Res. 46) providing for the completion of Dam No. 2 and the steam plant at nitrate plant No. 2 in the vicinity of Muscle Shoals for the manufacture and distribution of fertilizer, and for other purposes.

The PRESIDING OFFICER (Mr. SHEPPARD in the chair). The question is on agreeing to the amendment proposed by the Senator from Alabama [Mr. HEFLIN] to the amendment of the Senator from Mississippi [Mr. HARRISON], as modified, to sections 2, 3, and 4.

Mr. CURTIS. Mr. President, I suggest the absence of a quorum.

The PRESIDING OFFICER. The Secretary will call the roll.

The legislative clerk called the roll, and the following Senators answered to their names:

Barkley	Edwards	King	Schall
Bingham	Fess	La Follette	Sheppard
Black	Fletcher	McKellar	Simmons
Bratton	George	McLean	Smith
Brookhart	Gerry	McMaster	Steiwer
Broussard	Gould	McNary	Stephens
Bruce	Hale	Neely	Swanson
Capper	Harris	Norris	Thomas
Caraway	Harrison	Oddie	Tydings
Copeland	Hawes	Overman	Tyson
Curtis	Heflin	Pittman	Walsh, Mont.
Cutting	Howell	Ransdell	Warren
Deneen	Johnson	Reed, Pa.	Waterman
Dill	Jones	Robinson, Ark.	Willis
Edge	Kendrick	Sackett	

The PRESIDING OFFICER. Fifty-nine Senators having answered to their names, a quorum is present.

Mr. NORRIS. Mr. President, several days ago when I addressed the Senate on the subject of Muscle Shoals I had on the wall a chart which I asked unanimous consent to have inserted in the RECORD. That consent was granted, but the printing clerk and others found that it was impossible to have it reduced in size in time to go in the RECORD in connection with my remarks, so it was not included. Since that time I have had the chart revamped, and I now ask unanimous consent to have it inserted in the RECORD at this point as a part of my remarks and to include also with the chart the statistics which I send to the clerk's desk with the chart.

The PRESIDING OFFICER. Without objection, it is so ordered.

The statistics and chart are as follows:

COMPARATIVE COST OF DOMESTIC ELECTRIC SERVICE, UNITED STATES AND ONTARIO 1910–1926

By Judson King

The chart herein is based upon the following figures of the net average price in cents per kilowatt-hour for domestic service in a selected group of 32 American cities and all 21 Ontario cities of 10,000 population and up.

Year	United States, cost kilowatt-hour	Ontario, cost kilowatt-hour
	Cents	*Cents*
1910	9.2	[1] 9.3
1911	9.0	
1912	8.9	6.00
1913	8.7	5.06
1914	8.5	4.86
1915	8.0	3.83
1916	8.05	3.08
1917	8.1	2.89
1918	7.9	2.72
1919	7.8	2.55
1920	8.0	2.29
1921	7.9	2.20
1922	7.8	1.98
1923	7.7	1.83
1924	7.6	1.73
1925	7.5	1.76
1926	7.4	1.61

[1] Cost under companies prior to hydro. The Ontario hydro system began operation Oct. 11, 1910, with 5 cities and 9 towns to serve. By 1918 there were 21 cities and also 108 towns and villages connected.

Sources: United States: Electrical World estimates quoted at page 162 and charted at page 164 of a memorandum filed by the joint committee of National Utility Associations, Hon. George B. Cortelyou, chairman, with the Interstate Commerce Committee, United States Senate, January 19, 1928, in opposition to the Walsh resolution for a power investigation.

Ontario: 1914–1926, official bulletin hydroelectric power commission, January, 1927, page 8; November, 1927, page 411. Ante 1914, estimated from data in nineteenth annual report of commission, 1926, pages 340–349.

Cities used for comparison

UNITED STATES

	Population
Atlanta	250,000
Baltimore	819,000
Birmingham	217,000
Boston	793,000
Buffalo	550,000
Chicago	3,102,000
Cincinnati	412,000
Cleveland	984,000
Denver	289,000
Detroit	1,334,000
Houston	256,000
Indianapolis	374,000
Jacksonville	137,000
Kansas City	383,000
Los Angeles	1,300,000
Memphis	179,000
Minneapolis	447,000
Mobile	66,000
New Orleans	424,000
New York	5,970,000
Norfolk	179,000
Philadelphia	2,035,000
Pittsburgh	665,000
Portland, Me	76,000
Portland, Oreg	340,000
Richmond	191,000
St. Louis	839,000
San Francisco	576,000
Savannah	96,000
Scranton, Pa	143,000
Seattle	411,000
Washington	540,000
Total	25,377,000

ONTARIO

Brantford	28,010
Chatham	14,118
Galt	12,686
Guelph	19,219
Hamilton	122,238
Kingston	21,621
Kitchener	24,805
London	63,339
Niagara Falls	16,819
Ottawa	118,088

	Population
Owen Sound	12,231
Peterborough	21,726
Port Arthur	17,021
St. Catharines	21,810
St. Thomas	17,152
Sarnia	15,588
Stratford	18,888
Toronto	542,187
Welland	8,942
Windsor	52,638
Woodstock	10,114
Total	1,179,240

Domestic service, above cities only, 1926

	Average monthly bill	Average monthly use, kilowatt-hours
United States	$2.22	30
Ontario	1.79	98

Industrial power, total, 1926

	Kilowatt-hours sold	Revenue	Kilowatt-hours
			Cents
Entire United States	35,154,000,000	$461,000,000	1.31137
Entire Ontario	546,452,626	6,720,796	1.22990

Hence, at Ontario power rates the American power bill would have been less by $28,819,000.

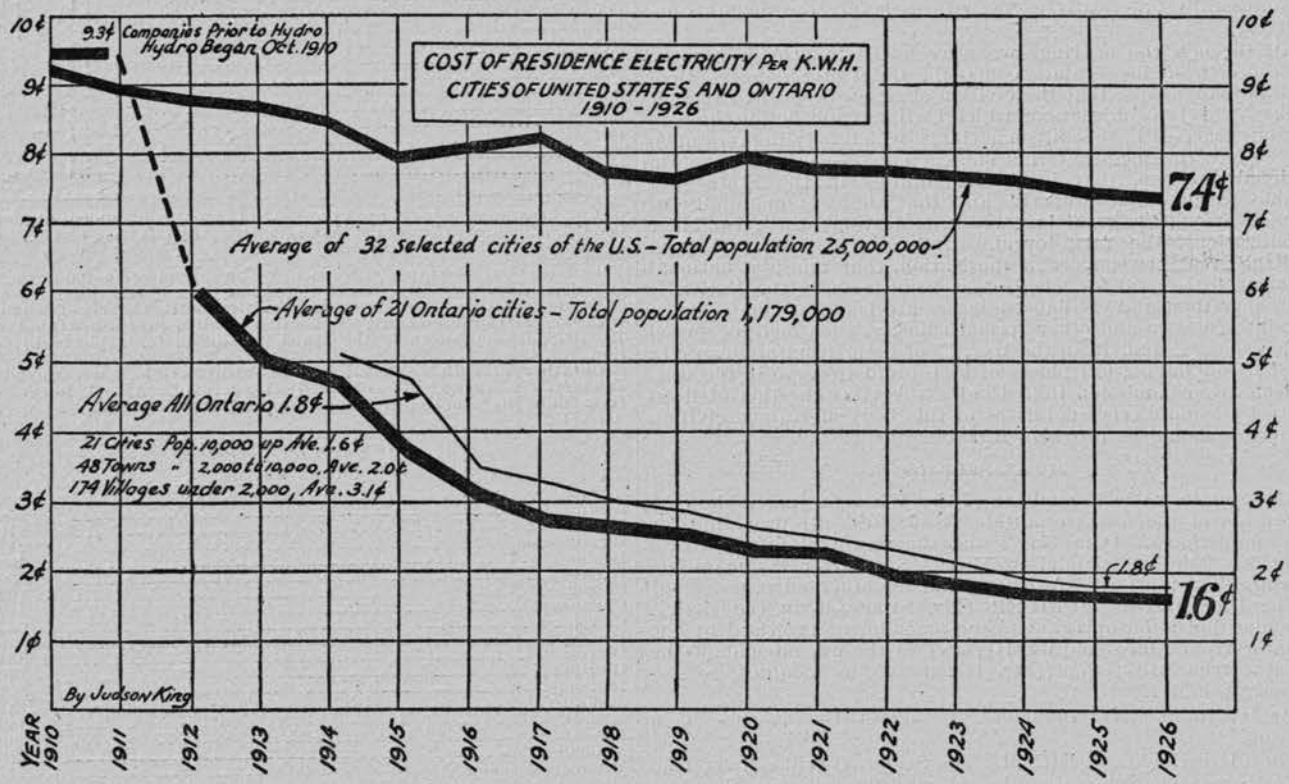
Domestic, commercial, and street light, 1926

	Kilowatt-hours sold	Revenue	Kilowatt-hours
			Cents
Entire United States	15,000,000,000	$1,018,200,000	6.788
Entire Ontario	638,486,973	12,987,676	2.034

At Ontario light rates the total American light bill would have been less by $713,000,000.

Sources: Electrical World, January 7, 1928, tables, page 18. List of cities, United States Labor Review, August, 1927, page 203. For Ontario data: Bulletins and Reports, page 1.

Why This Difference?



Average Price in These American Cities to Domestic Consumers in 1926	**7.4c K.W.H.**
Average Price "Service at Cost" in Ontario Cities in 1926	**1.6 c**
Since Hydro does not pay taxes in proportion to U. S. add 10%	.16
Since Hydro does not pay dividends, add a fair profit of 10%	.16
Since Hydro generates by water power and 23 of the above U. S. Cities generate chiefly by coal, add per K.W.H.	.48
Adding these American extras would raise the Ontario price to	2.4c K.W.H.
Leaving Unexplained Why American Consumers are Forced to Pay an Added	**5c K.W.H.**

Mr. HEFLIN. Mr. President, I ask unanimous consent to have printed in the RECORD a letter addressed to me by Mr. Thomas W. Martin, president of the Alabama Power Co. The Alabama Power Co. have been criticized by both Senators from Nebraska and some other references have been made to their rates and practices. I told Mr. Martin I thought it was but fair that he should have an opportunity to give an account of the conduct of his company and of the rates they charge, and that I would be glad to ask to have his statement printed in the RECORD. I ask unanimous consent that it may be printed in the RECORD at this point.

The PRESIDING OFFICER. Is there objection? The Chair hears none, and it is so ordered.

The letter is as follows:

ALABAMA POWER CO.,
Birmingham, Ala., February 25, 1928.

Hon. J. THOMAS HEFLIN,
United States Senate, Washington, D. C.

DEAR SENATOR HEFLIN: A number of tables and schedules prepared by Mr. Kenneth G. Harlan, public-utility expert for the city of Tacoma (Wash.) municipally owned plant, were inserted in the CONGRESSIONAL RECORD February 15, 1928 (pp. 3038–3044). Rates are quoted for the Tacoma plant and compared with rates in the privately owned plants of the Alabama Power Co., operating in a large portion of Alabama.

We desire to submit for your information and that of the Senate a statement showing the average rate on the system of the Alabama Power Co. which has been prepared on the same basis of average kilowatt-hour sales as was employed by Mr. Harlan, the expert of the publicly owned plant in Tacoma, for purposes of comparison with rates in Alabama; and also relating to other statements in the Senate respecting this company.

Mr. Harlan says:

"The foregoing computations are based upon the combined amount of energy served annually to all classifications of business divided into the total revenue received, which gives the average rate of kilowatt-hour, and which in the last analysis reveals the true status of the rate structure, irrespective of what may result in the comparison of rates at certain points or in certain schedules or classifications of service" (p. 3039).

Mr. Harlan shows that the average rate in Tacoma per kilowatt-hour is 1.0427 cents. He makes no attempt to show the average rate on the system of the Alabama Power Co. Since the Alabama Power Co. in 1927 sold to and interchanged with utilities outside the State 422,747,000 kilowatt-hours of energy because of a supply of power from Muscle Shoals, this amount has been deducted for purposes of comparison. The comparative results follow:

Producer	Total kilowatt-hour sales	Revenues	Average rate
			Cents
Tacoma	168,648,489	$1,758,558.30	1.0400
Alabama Power Co	1,050,107,427	13,079,600.02	1.2457

Thus the average rate per kilowatt-hour on the system of the Alabama Power Co., serving almost a whole State, with many scattered communities, both large and small, only slightly exceeds that of the Tacoma plant, serving a single large city. If State, county, and municipal taxes and license fees were deducted, the average rate for the Alabama Power Co. system would be less than shown above. The average revenue per unit of output for the entire industry in the United States in 1926 was 2.3 cents per kilowatt-hour.

In this connection it is interesting to compare the average rate in Alabama with that of a number of outstanding municipally owned plants, both excluding and including that of Tacoma. The comparative results follow:

Name of producer	Total kilowatt-hour sales	Revenue	Per kilowatt-hour sold
			Cents
1. Seattle	178,819,600	$3,859,042	2.17
2. Cleveland	134,115,639	3,110,302	2.32
3. Los Angeles	488,538,323	11,190,323	2.30
4. Jamestown, N. Y.	16,532,364	482,849	2.92
5. Springfield, Ill.	18,016,267	479,613	2.66
6. Jacksonville, Fla.	54,621,675	2,169,957	4.00
Total of above	890,643,868	21,292,086	2.39
7. Tacoma	168,648,331	1,758,558.30	1.04
Total, including Tacoma	1,059,292,199	23,050,644.30	2.18
8. Alabama Power Co	1,050,107,427	13,079,600.02	1.24

1. Calendar year 1926; official report city lighting department.
2. Calendar year 1926; official report bureau of municipal light plant.
3. Year ending June 30, 1926; official report bureau of light and power.
4. Calendar year 1926; Public Service Commission of New York.
5. Year ending Feb. 28, 1927; eleventh annual report city water, light, and power department.
6. Calendar year 1926.
7. Year ending Sept. 30, 1927, including power sold to municipalities. (CONGRESSIONAL RECORD, Feb. 15, 1928, p. 3039.)
8. Calendar year 1927.

You will note:

(a) That the average of the first six municipal plants mentioned is 2.39 cents per kilowatt-hour, as compared with 1.2457 cents in the Alabama Power Co. system.

(b) That if Tacoma be included the average rate is 2.18 cents for the seven municipal plants, as compared with 1.2457 cents in the Alabama Power Co. system.

(c) You will also note that while the total kilowatt-hours sold in the seven municipal plants combined is about the same as the Alabama Power Co., the total receipts exceed that of the Alabama Power Co. by nearly $10,000,000.

Mr. Harlan correctly states that the average kilowatt-hour basis "reveals the true status of the rate structure, irrespective of what may result in the comparison of rates at certain points or in certain schedules or classifications of service." Different physical and climatic conditions, the character and source of power supply, the extent of the territory served, and the nature of the business of the consumer make necessary a number of classifications of service and different schedules of rates to fit the varying conditions which prevail in different States.

Questions arise from time to time in the adjustment and application of these schedules and classifications which are determined by the State commissions. Moreover, many factors are involved in the cost of service which make any direct comparison of rates as set up by Mr. Harlan, at page 3038 of the RECORD, February 15, 1928, of little value. In the case of Tacoma, the ordinance upon which the rate is based specifically provides for the separate and individual negotiation and approval by the city council of all contracts for blocks of power greater than 1,000 kilowatts (Report and Information Book, light department, Tacoma, 1925, p. 79). Mr. Harlan draws the same conclusion when he says that "such comparisons, while they may be properly computed, are void of any material importance, nor can they be seriously considered when true comparison of rates are sought" (p. 3039).

The Alabama Power Co. has in recent years acquired 23 municipally owned lighting plants that are now connected with its distribution system. In each case the sale of the plant was first approved by the governing board of the city and then submitted to a vote of the people, as is required by the laws of Alabama. In many instances the vote was practically unanimous. A study of the municipal rates in effect at the time of sale in these communities will show rates ranging from 10 cents to 25 cents per kilowatt-hour, and in most cases they were flat rates with but little reduction for increased use. However, while these communities were interested in obtaining a reduction in the lighting rates, they were specially interested in obtaining power which would attract industries into their communities.

Domestic rates in effect in all towns connected with the system of the Alabama Power Co. range from 9 cents per kilowatt-hour (with the exception of a few communities where it is 10 cents) for the first block of energy used for lighting purposes alone down to 5 cents per kilowatt-hour. Where energy is also used for other household purposes, such as cooking, water heating, ironing, washing, refrigeration, etc., the rate, dependent upon amount of consumption, goes down to 2½ cents per kilowatt-hour. The result has been to increase greatly the number of customers as well as the per capita use of energy.

The following table shows typical rate results before and after the acquisition of municipally operated plants in Alabama:

Net lighting rates

Town	Before purchase	Present [1]	Per cent reduction
	Cents	*Cents*	
Albertville	12½	9	28
Boaz	12½	9	28
Camp Hill	13	9	30
Carbon Hill	11¼	9	20
Dadeville	12	9	25
Haleyville	20	9	55
Livingston	25	9	64
Ozark	15	10	33
Russellville	20	9	55
Union Springs	12½	9	28
Uniontown	18	9	50
Wetumpka	13½	9	33
York	18	9	50

[1] This reduces to 3½ and 2½ cents per kilowatt-hour less 10 per cent discount where energy for cooking and heating is combined with lighting.

The city of Birmingham for many years owned municipal lighting and water plants serving part of the territory embraced within the corporate limits of Birmingham. An election was held on November 15, 1927, after extensive advertising, on the question of selling these plants

for private operation, and was approved by a vote of the people. The sale was completed January 4, 1928.

Nine reasons why the city commission favored the sale of the plants were given by Hon. J. M. Jones, president of the commission, as follows:

"1. Because the people of North Birmingham have petitioned the city commission to sell them.

"2. Because the patrons of these plants are not receiving as good service as other people of Birmingham.

"3. Because the people of North Birmingham are paying a higher rate for electricity than the rest of the people.

"4. Because the city is simply selling two distribution systems.

"5. Because the city is now buying current and water at wholesale from the utilities and retailing it.

"6. Because since 1910 the city has operated these plants at an annual loss of over $11,000.

"7. Because the price offered for these plants is the appraised value fixed by Morris Knowles (Inc.), a nationally known and impartial appraiser.

"8. Because the price offered for these plants is fair and reasonable, being the full appraised value as fixed by Morris Knowles (Inc.).

"9. Because the city commission pledges itself to spend the proceeds of these sales only in other paramount public improvements."

President Jones further said:

"It is the unanimous opinion of the city commission that these plants should be disposed of for the best interests of the entire city. It is an excellent opportunity to turn a liability into an asset. If the plants are not sold the city must continue to operate them and take the loss that results. The responsibility is with the people. The commission is anxious for the people to have the full facts."

The case of Alabama Pipe Co. et al. *v.* Alabama Power Co., heard by the Alabama Public Service Commission and decided September 30, 1927, involved an adjustment of certain rates of the company. In the course of the opinion the commission said:

"'Every utility is entitled to just and reasonable rates as will enable it at all times to fully perform its duties to the public and will, under honest, efficient, and economical management, earn a fair net return on the reasonable value of its property devoted to the public service. This is our law. However, this does not mean that rates for all classifications of service should be the same.'—Alabama Power Co., supra.

"Representative of complainants made reference to the contract between the Alabama Power Co. and the United States Government for the purchase of a portion of defendant's power requirements from the Wilson Dam plant, the price paid therefor, and the distance of the location of a number of complainant's plants from the Muscle Shoals power supply. No evidence was introduced, however, to sustain a contention that customers located nearer the Muscle Shoals source of supply should have preferential rates on account of the proximity of their plants to the source of supply.

"Complainants have not undertaken in this case to show by evidence that we are justified in so regulating defendant's rates for power generated at Muscle Shoals by the United States, as to require defendant to distribute and sell such power at lower rates to those near by than to those farther distant within the State of Alabama. We are not prepared to say that the water-power resources at Muscle Shoals should be distributed upon a basis founded upon a theory that such resources exist primarily for those near by and that near-by customers should have a preference in rates over all other customers located in other parts of the State. Certainly no evidence has been offered in this case to justify any such conclusion.

"The defendant's rate structure, in so far as rates for power are concerned, is based on uniformity to all communities served, and it has observed this basis since its hydroelectric system was first constructed and put into operation over 15 years ago.

"The system of defendant utility, beginning with a single generating plant some 15 years ago, has rapidly extended until its transmission system now covers the greater portion of the State, with many large sources of power supply. In addition to the Muscle Shoals source of supply, there are at present two large hydroelectric plants on the Coosa River, three hydroelectric plants on the Tallapoosa River, and three large steam reserve plants, in addition to defendant's interchange connection with other power companies.

"These large steam reserve plants are located in or close by the coal deposits of the State. Complainants, through their representatives, have raised the question whether the power latent in the Coosa River, the Tallapoosa River, and other streams of the State capable of generating hydropower sufficient to justify their development for this purpose, and that which is latent in the coal deposits within the coal fields of Alabama, should be distributed throughout the State under a rate structure which would require the more distant cities, towns, and communities to pay a higher rate than those adjacent to the generating sources of such power because of such difference in distance. The thinking mind will see at once this raises a big question. To zone this State for rate-making purposes in the distribution of such power would require an entire change in that plan of defendant's rate structure, which, as we have pointed out, has been followed since the defendant began such utility operations. Complainants have not furnished evidence to show that such change is justified, or if justified, what plan of rates would be just and reasonable on such new and different basis. Such a change would involve material interests of all the customers of the utility throughout the entire State and of every city, town, and hamlet of the State. Even if these particular complainants had brought before us in this case substantial evidence in support of this zoning theory for rate-making purposes, which has not been done, we would have to shut our eyes to most important and material interests of all those customers of defendant located in cities and communities other than those represented by the present complainants, if without notice to them and the right to be heard, we should undertake to require defendant in this proceeding to apply such zoning theory of rate making.

"Within the last few years the defendant, at the instance of the agricultural interests, has extended its transmission lines into rural communities to make the State's power resources available to the farmer, to aid him, if possible, in the solution of his difficult problems and in order to make home life upon the farm more attractive. The transmission of power from the sources named to the smaller towns and villages of the State makes every such town and village a potential location for manufacturing industries. Economists who have given long and careful thought to the future development of Alabama are practically unanimous in the view that our State as a whole is best adapted to development as a manufacturing and industrial community rather than an agriculture section. It is a matter of common knowledge that agriculture in Alabama is finding it increasingly difficult to compete in the production of cotton with States more favorably adapted, such as Texas and Oklahoma."

The rate schedules of this company have been developed with the view of serving the general purposes indicated in the foregoing opinion of the commission. By far the greater portion of the energy sold in Alabama is used in industry, resulting, as it does, in the decentralization of industry throughout the State, creating pay rolls and other advantages to the communities because of large available quantities of power.

In the recent Commercial Survey of the Southeast, 1927, published by the Department of Commerce, at page 113, it is shown that in the 12-year period from 1914 through 1925 manufacturing in the Southeast increased in greater proportion than for the United States as a whole, the percentage of increase in the value of manufactured products in the Southeast being 203 per cent, compared with 159 per cent for the country as a whole. The most recent two-year period shows extraordinary development, the combined value of manufactured products in the States of North and South Carolina, Georgia, Florida, Alabama, and Tennessee having been $305,138,380 more in 1925 than it was in 1923.

Reports from the Geological Survey show the output of power in the six States of North Carolina, South Carolina, Florida, Tennessee, Alabama, and Georgia increased from 3,828,281,000 kilowatt-hours in 1923 to 6,911,421,000 kilowatt-hours in 1927, an increase of 78.6 per cent compared with 46.8 per cent increase in the same period for the Nation as a whole.

The public utilities of the United States in 1927 showed an increase of power output of more than 8 per cent over 1926, while in the South the increase was more than 16 per cent over 1926, or twice the percentage of increase in the Nation as a whole. This tremendous gain in power consumption not only explains the rapid growth of public utilities in the South, but also indicates the continued expansion of southern industries. It offers a yardstick for the measure of industrial development and in this respect reflects the greater activity experienced by southern industry in 1927 as compared with former years. New plants and plant enlargements have required additional power, and by the building of steam and hydroelectric generating stations public utility power companies are endeavoring to supply the growing power needs of the South. (Manufacturers Record, January 19, 1928.)

Continued growth in the South is closely related to the ability of the public utilities to supply increasing power needs for industrial and other purposes.

It has been stated that the Alabama Power Co. is buying Muscle Shoals power at a very low rate under the temporary arrangement, in effect for two years, pending disposition of Muscle Shoals by the Congress. The rates under this contract are from 2 to 4 mills per kilowatt-hour for power for use in Alabama and in power systems in other States with which the lines of Alabama Power Co. are interconnected. The agreement with the Secretary of War is to purchase power of the Government in lieu of operating steam plants on the system of the Alabama Power Co. when the demand on its system or that of interconnected companies operating in other States requires a supply of power in excess of the water-power resources on their own system. Therefore, operation of the Government plant has not been continuous.

Under these circumstances the price paid is graduated on a scale commensurate only with the increment cost for generating an equal amount of power from the several steam plants on the system of the Alabama Power Co. Furthermore, the arrangement is revocable on 30 days' notice, which means that the company must be prepared with plants sufficient to replace the Muscle Shoals power. This necessarily

affects the price that can be paid for temporary use, because the company could not make firm contracts to furnish consumers with Muscle Shoals power and depend on a contract with the Government revocable on 30 days' notice. Such temporary arrangement deprives the Government of increased revenue which would come from maximum output secured through full use of power-plant facilities, especially the opportunity to utilize much of the secondary power going to waste because of inability to coordinate the plants with interconnected reserve plants in the coal regions and in other watersheds. Even under the present arrangement the Government has collected $2,390,038 for 1926 and 1927.

The difference in price paid to the United States, from 2 to 4 mills, and the average received by the Alabama Power Co. in 1927 for all power sold does not represent profit. To this must be added fixed charges, operating expenses and other overhead, interest on investments in reserve steam plants, in transmission lines, substations and local distribution systems, and various forms of taxes, plus losses in transmission from point of generation to points of consumption throughout the State and into other States.

I am, very respectfully,

THOS. W. MARTIN, *President.*

Mr. HOWELL. Mr. President, at an expense of about $50,000,000 the United States Government has developed a great machine at Muscle Shoals whose finished product is electrical energy in a form for distribution. It was originally proposed that this great plant should be devoted to the manufacture of fertilizer. My distinguished colleague, the senior Senator from Nebraska [Mr. NORRIS], has clearly shown that the electrical method of producing fixed nitrogen is no longer commercially important; that a synthetic method has been developed which enables the production of fixed nitrogen at a much lower cost.

The question arises, Shall we carry out our original idea; use Muscle Shoals in an inefficient manner for the production of fixed nitrogen, or shall we sell our finished product, electric energy, and utilize the funds derived therefrom to promote synthetic production? There can be no question as to what ought to be done. The Government should not proceed in this matter in any other way than would private business. Assuming that such will be the conclusion of the Senate, then the question arises, How shall we dispose of the electrical energy? Shall we turn it over to private interests for distribution, or shall we, the Government, continue to develop electrical energy, transmit it to points of use—that is, to municipalities—and sell it at wholesale for local distribution?

Mr. President, if the pending resolution is adopted by the Senate and ultimately becomes a law, the possible benefits to the municipalities within practical transmission distances of the Muscle Shoals hydroelectric plant will be far-reaching, indeed. These benefits will be such as result from the advantages of public ownership, advantages to the public, and for which my colleague has been contending for years in connection with this great hydroelectric development.

What are the advantages of public ownership?

It is the practice of public service commissions throughout the country to adjust the charges for service which a public utility may collect from its patrons so as to amply provide for all expenses of operation, maintenance, a reserve for depreciation, a fixed rate of return upon the value of the plant, and, finally, a surplus, as otherwise there might be a deficit.

The rate of return allowed a utility varies from 7 to 8 per cent in the different States. Assuming the average to be 7½ per cent, the rate in the District of Columbia, then 7½ per cent is what the public is called upon to pay upon capital invested in privately owned utilities. However, if the utility is publicly owned, the rate of return is the interest charge upon outstanding bonds representing the indebtedness of the plant, or in the neighborhood of 4¼ per cent. The difference between these two rates, 7½ per cent and 4¼ per cent, is 3¼ per cent, which represents the saving in favor of public ownership.

As to what this saving means, consider a $10,000,000 plant. Three and one-fourth per cent of $10,000,000 is $325,000. This sum invested annually at 4 per cent compound interest will equal $10,000,000 within 21 years.

This is the first of the financial advantages I shall enumerate resulting from public ownership; in fact, is the chief advantage of this character, and, of course, inures to the public—that is, the consumers.

The second advantage of public ownership is in connection with reserves for depreciation. The annual amount allowed to be deducted from income and placed in this reserve is a matter of estimation, and, as a rule, if there is error, it is on the side of liberality. As a consequence, such reserves from this cause alone tend to accumulate. But there is another and major cause of the undue growth of reserves for depreciation. The purpose of this reserve is to take care of replacements. However, the line of demarcation between maintenance and replacements is so shadowy and vague that a utility management, both consciously and unconsciously, tends to maintain the value of a plant in the neighborhood of 100 per cent at the expense of maintenance, thus sparing the reserve for depreciation. This is not a difficult thing to do in connection with a plant whose component parts consist of diverse units dispersed over a considerable area, as in the case of an electric plant. In fact, it rather does itself, and especially so if the annual surplus is making strides ahead, as such a tendency, if persistent, ultimately results in an order by the regulating authority for a reduction in rates. The depreciation reserve of the Potomac Electric Power Co. serving Washington, D. C., was, at the close of 1926, $5,372,000, or 17½ per cent of its value for rate-making purposes, not including this reserve.

If a utility is privately owned such a reserve for depreciation, in one way or another, ultimately appears, in whole or part, in the capitalization of the plant, and thus indirectly reaches the pockets of the stockholders. If a utility is publicly owned, however, such excess accumulations are used for the extinguishment of the debt of the plant or for new capital expenditures. this inuring to the benefit of the public; that is, the consumers.

The third advantage of public ownership is derived from the ultimate disposal of the annual surplus. If the utility is privately owned, such surpluses ultimately reach the pockets of its stockholders. If the utility is publicly owned, annual surpluses are applied to the extinguishment of the debt of the plant, or are used for new capital expenditures, thus also inuring to the benefit of the public; that is, the consumers.

Again using the Washington, D. C., electric plant as an example: The surplus for 1926 was about $800,000 or 26 per cent of the plant's value, not including depreciation reserve. This sum invested annually at 4 per cent interest would equal the value referred to—$30,728,000—in less than 24 years.

The results of these three advantages in practice are illustrated in the case of the water plant of Omaha, my home city. This utility was acquired by the municipality in 1912 at a cost of $6,400,000. During the 15½ years ending December 31, 1927, the plant has been operated by a public corporation identical in form and organization with a private corporation. As a result, the methods of private operation and corporate accounting have been strictly followed, and rates reduced whenever persistent surpluses have justified such a course. The plant was paid for out of the proceeds of a 4¼ per cent bond issue; hence the first advantage of public ownership has consisted of an annual saving of 3¼ per cent upon the average investment, approximating $266,000 per annum.

During the 15½ years there was placed in the reserve for depreciation—mark you—$1,878,000, of which but $96,000 has been expended. In short, on the 1st day of January of this year there was in the reserve for depreciation $1,878,000, less $96,000. Thus the average net increment added to this fund has been about $115,000 per annum, and represents the second advantage of public ownership. This undoubtedly would have gone into the pockets of private stockholders had the plant been privately owned.

The annual surplus, which is responsible for the third advantage of public ownership, has averaged during 15½ years $109,000, which also, under private ownership, would have accrued to stockholders.

The total of these three advantages in this case is $490,000 per annum, which, if invested at 4 per cent compounded annually, would equal the cost of the plant, $6,400,000, in between 10 and 11 years. I have assumed 4 per cent compound interest only, but, as a matter of fact, we should have assumed 7½ per cent. Therefore there is an ample margin of safety in my conclusions.

Mr. BROOKHART. Mr. President, will the Senator from Nebraska yield?

The PRESIDING OFFICER. Does the Senator from Nebraska yield to the Senator from Iowa?

Mr. HOWELL. I yield.

Mr. BROOKHART. I will ask the Senator from Nebraska if he expects to consider the element of capitalizing unearned increment under private operation?

Mr. HOWELL. Mr. President, I have confined myself to these three very apparent advantages. There are others which I shall not discuss for lack of time.

Mr. BROOKHART. The unearned increment would be in many cases a very considerable item. Take the Keokuk Dam, for instance, at the time it was built. It could now be recapitalized on a basis of cost of reproduction, which means adding unearned increment, very much higher than would have been justified in the beginning, although, I think, in the beginning its constructors capitalized unearned increment.

Mr. HOWELL. I have merely considered, in determining the average capital invested, the amount of money actually ex-

pended upon the water plant, which is about $11,500,000, including purchase price and improvements. A recent tentative valuation of the plant, on the basis of reproduction new, less depreciation, reached about $16,000,000. In short, this would be the rate base upon which the people of Omaha would now be paying 7½ per cent return were the water plant privately owned.

Mr. ROBINSON of Arkansas. Mr. President, will the Senator from Nebraska yield to me?

The PRESIDING OFFICER. Does the Senator from Nebraska yield to the Senator from Arkansas?

Mr. HOWELL. Certainly.

Mr. ROBINSON of Arkansas. What is the capitalization of the corporation, who owns the stock, and what is the amount of the stock of the Omaha corporation?

Mr. HOWELL. There is no stock outstanding; it is simply a public corporation, identical in form and organization with that of a private corporation, which is owned by the people of the city of Omaha.

Mr. ROBINSON of Arkansas. No stock has been issued?

Mr. HOWELL. No stock has been issued. It is similar to a school district, except that it manages utilities instead of schools; it is another corporate district superimposed upon the city of Omaha.

Mr. ROBINSON of Arkansas. Does the city operate the plant?

Mr. HOWELL. A board of directors that is elected by the stockholders, who are all of the people instead of a part of the people, operate the plant and have full control of its assets, fix the rates—in fact, determine everything with reference thereto, just as in the case of a private holding and operating corporation.

Mr. ROBINSON of Arkansas. When the Senator from Nebraska says the board of directors are elected by the stockholders, he means by the electors of the city of Omaha, I presume, since he has just stated that there are no stockholders in the sense that stock has been issued and is held?

Mr. HOWELL. No stock has been issued; however, the people are the stockholders, in fact.

Mr. ROBINSON of Arkansas. Has the Senator gone into the question of the cost of operation?

Mr. HOWELL. I have done so quite thoroughly.

Mr. ROBINSON of Arkansas. What does it cost to operate the plant?

Mr. HOWELL. I have not the details here, but the total cost of operation is somewhere in the neighborhood of $700,000, as I remember.

Mr. ROBINSON of Arkansas. Annually?

Mr. HOWELL. Annually.

Mr. ROBINSON of Arkansas. Does the Senator expect to include in his remarks a discussion of the plan or method under which the Omaha corporation is operating? Is he going into that?

Mr. HOWELL. I had not intended to go into the details, but I might add that the law under which the Metropolitan Utilities District, which is the name of the organization as incorporated, provides that there shall be a board of six directors, two of whom shall be elected every two years at the time of the biennial State election, one director so elected to be a Democrat and one a Republican. The law contemplates a nonpartisan board.

Mr. ROBINSON of Arkansas. Does not the Senator mean a bipartisan board?

Mr. HOWELL. A bipartisan board is the nearest to a nonpartisan board that seems humanly possible. The fact that two directors are elected every two years for six years also renders possible a continuity of policy. The directors have full control of the plant, its business, and assets to the same extent as in the case of a private corporation.

Mr. ROBINSON of Arkansas. How many directors are there?

Mr. HOWELL. There are six. If additional capital is needed the board has the right to submit a bond proposition to a vote of the people. I might add that during the fifteen and a half years the water plant has been owned by the public no additional bond issue has been asked for, its reserves having largely afforded all necessary new capital. I might add that the number of consumers to-day is double the number when the plant was taken over in 1912.

Mr. ROBINSON of Arkansas. How does the cost to the consumer compare now with what it was when the corporation was formed?

Mr. HOWELL. The maximum rate has been reduced 52½ per cent. For 12 years bills were issued at the same old rate, the discount of 52½ per cent was calculated and subtracted from the total and indorsed thereon, preceded by this legend in red, "Public ownership reduction, 52½ per cent." This was done so that the people might be reminded each month what public ownership was doing for them. The public, as a rule, scarcely remembers anything longer than seven days.

Mr. ROBINSON of Arkansas. Mr. President, I would not want to admit the accuracy of that statement. I do not care, however, to contradict it for the purpose of the Senator's argument.

Mr. HOWELL. Let me say this, then, that the opponents of public ownership in the face of such a showing will not remember longer than seven days—will even deny the facts after the lapse of a week.

Mr. FLETCHER. Mr. President, will the Senator yield to me?

The PRESIDING OFFICER. Does the Senator from Nebraska yield to the Senator from Florida?

Mr. HOWELL. I yield.

Mr. FLETCHER. Of course, the success of an enterprise such as that to which the Senator from Nebraska is referring depends almost entirely on the management. May I ask if the directors meet regularly and actively participate in the control and management of the system, or do they elect a general manager or a president or some other officer, turn it over to him, and meet once a month just to confirm what he does?

Mr. HOWELL. Under the law the board of directors must meet once a week, and under the law they are authorized and directed to appoint a general manager, who holds his office at the will of the board. I might also add that the board of directors does meet weekly, does function, and has functioned for the last 15½ years in a highly efficient manner.

Mr. President, it may be urged that one example does not prove a case. Therefore let us consider the Omaha gas plant which was acquired in 1920 at a cost of $5,000,000.

The first advantage of public ownership heretofore referred to proved to be less in this case than in that of the water plant, as the money borrowed was on the basis of 5 per cent. In other words, there was only a saving in interest of 2½ per cent instead of 3¼ per cent in that case, as the plant was taken over and bonds issued in 1920 at a time when money rates were higher than at present.

Now, mark you, the total of the depreciation reserve for the seven and one-half years which have elapsed since the purchase of the gas plant, up to the 1st day of January, 1928, was $685,000, of which but $28,000 have been expended for replacements. This is an average plant; this is what usually takes place in all private plants.

Mr. ROBINSON of Arkansas. Mr. President, why is so large a depreciation reserve established and maintained?

Mr. HOWELL. There has been a constant effort on the part of public utility corporations to boost the reserves for depreciation allowed by public service commissions. It is to their interest.

Mr. ROBINSON of Arkansas. Is the object to make the cost of service greater?

Mr. HOWELL. No; the effect might be to maintain rates at their level, but the purpose is to increase the profit. Unjustifiable depreciation reserves are partially responsible for the pyramiding of electrical companies and securities in this country.

Mr. ROBINSON of Arkansas. I am speaking now with reference to the Omaha corporation. It appears that it is maintaining a very large depreciation reserve, as is shown by the very small amount of such depreciation reserve which has been used, and I asked why the corporation maintains so large a reserve?

Mr. HOWELL. Mr. President, the reason therefor is this: When we took over the plant in 1920 the gas company, which was owned by the United States Gas Improvement Co. of Philadelphia, insisted that an annual sum equal to 6⅔ cents per thousand feet of gas sold should be covered necessarily into the reserve for depreciation. We accepted this dictum and put it in effect when we took over the plant. In other words, we have been operating the plant just exactly as they would have operated it; and had they still owned and been operating the plant they would have been setting aside this reserve every year, and they would have had the money. Now the people of Omaha have the money. Again, a gas plant is a much more profitable utility than a water plant, and as a consequence its surplus has averaged $220,000 a year.

Mr. President, since 1920 gas plants have been enormously profitable in this country. During the war period they were securing increases in rates because of the rise in the cost of supplies. Following 1920, supplies began to go downhill very rapidly; but the rates did not go down in the same proportion. At the same time gas companies were insisting upon valuations based upon the unearned increment, to which the Senator from Iowa [Mr. BROOKHART] referred just a few moments ago. As

a consequence, while we were piling up these reserves, growing melons for the people of Omaha with our gas plant, in New York City and in Brooklyn they were "cutting melons" for their stockholders—100 per cent stock dividends in each case.

Thus, in the case of Omaha's gas plant, these three advantages of public ownership are measured by $458,000 per annum, which, if invested at 4 per cent compounded annually, would equal $5,000,000, the cost of the plant, within from 9 to 10 years.

There is still another example to quote in connection with Omaha's utilities. Because of the increase in the charges for delivered ice during the war from 50 cents to 70 and 80 cents per 100 pounds, an ice plant was established in 1919, and a second one constructed in 1921. These utilities were far more profitable than even the gas plant, their total cost—$700,000—being amortized by the close of the season of 1926. In short, these ice plants paid for themselves within seven years. Thus, in Omaha these three advantages of public ownership have paid off the cost of the ice plants in less than 7 years; would have paid off the cost of the gas plant in from 9 to 10 years; and the cost of the water plant in from 10 to 11 years.

Therefore, it may be stated with confidence that if the average operating methods and practices of private operation are maintained public ownership will pay for a utility plant within 12 years. This may be assumed as a truism which applies to every public utility in this country privately owned and on a profitable basis.

The policy adopted in Omaha was not to amortize plant indebtedness within the shortest possible time but to use the accumulations of surplus and in the depreciation reserves for the extension and improvement of the plants; further, not to maintain the rate of return on the capital invested at 7½ per cent but to forego accretions from this source and reduce rates. Thus, the maximum water rate was reduced 52½ per cent, resulting in a saving to the people of more than $5,000,000 during the 15½ years. Gas rates which formerly varied from 90 cents to $1.15 per thousand cubic feet have been reduced so that they now vary from 70 cents to 90 cents.

In the case of the ice plants, they regulated the price of delivered ice in Omaha, it promptly dropping back to 50 cents per 100 pounds, while some 52 neighborhood ice stores have been established from which people, for most of the time, have been able to purchase cash-and-carry ice in 5-cent chunks at the rate of 30 cents per hundred pounds—recently reduced to 27½ cents.

Nevertheless, the combined financial statement of these plants for December 31, 1927, show that while they have cost $19,908,000, and have current assets of $4,387,000, or a total of $24,295,000, yet the bonds outstanding and current liabilities totaled but $11,713,000, indicating for the 15½ years of public ownership of the water plant, 8½ years of the ice plants, and 7½ years of the gas plant, the accumulation of an apparent net worth of $12,563,000, or about $60 per inhabitant, nearly $300 per family in Omaha.

Mr. BROOKHART. Mr. President——

The PRESIDING OFFICER. Does the Senator from Nebraska yield to the Senator from Iowa?

Mr. HOWELL. I do.

Mr. BROOKHART. Mention has been made of the question of management. Has there been any trouble in securing efficient managers of these enterprises?

Mr. HOWELL. There has been no difficulty in connection with the conduct of these plants. A responsible board of directors has assured efficient management; and I am confident that under the organization that is in effect, which is applicable elsewhere, which is applicable in our governmental business—that is, of definitely lodging responsibility, centralizing it in a board of directors—you can have public business as well conducted and efficiently dispatched as private business, for such has been the result in connection with Omaha's utilities.

Mr. BROOKHART. Is it not true that the mismanagement of public enterprises usually comes from the control of public enterprises by private enterprises, and their influence and power in reference to the management?

Mr. HOWELL. Mr. President, the great foes of public enterprises of this kind are the privately owned public utility managements, serving the people alongside. They are constantly trying to break down the confidence of the people in the efficiency of their plants. In the case of Omaha they have failed. In fact, it was the efficiency of management and achievements of the water plant that brought about public ownership of ice plants in seven years and of the gas plant the year after the initiation of the first ice plant. If the public had not been convinced that the water plant was efficiently conducted, further public ownership never would have come to pass. As it was, however, the public definitely and positively refused to grant another franchise to the gas company, thus compelling its owners to sell.

Mr. LA FOLLETTE. Mr. President——

The PRESIDING OFFICER. Does the Senator from Nebraska yield to the Senator from Wisconsin?

Mr. HOWELL. I yield.

Mr. LA FOLLETTE. May I ask the Senator whether the electric utility is publicly or privately owned in Omaha?

Mr. HOWELL. The electric utility is privately owned in Omaha.

Mr. LA FOLLETTE. What has been the effect, if any, of the successful operation of these public undertakings upon the rates which the private utility in electricity charges to consumers in Omaha?

Mr. HOWELL. Mr. President, in 1912, when the water plant was taken over, the maximum rate charged to consumers in the city of Omaha for domestic service was 14 cents a kilowatt-hour.

The effect of our taking over the water plant, after a 16 years' contest, was that almost immediately the electric light company reduced its rate from 14 to 12 cents. A year later we began installing two small electric units at the water plant to supply the plant with its required electrical energy. When these units were installed it was found, in 1914, that the energy, even with these small units, could be placed upon the switchboard, at the then cost of coal, for three-fourths of a cent a kilowatt-hour. This fact was proclaimed to the people of the city, and within one month the rate was reduced to 11 cents a kilowatt-hour. We then went to the legislature and asked for an enabling act authorizing the people of Omaha to vote upon the question of extending their electric plant. The bill passed both houses of the legislature, but was vetoed by the governor upon the ground that it was unmoral to allow the public to compete with a private corporation; but they knew they had had a fight, as the rate immediately came down, in 1916, to 8½ cents.

Two years later we appeared at the legislature again; they said for another raid, and the day before it met the company reduced the rate to 6 cents, and now the maximum is 5½ cents in the city of Omaha. In other words, we have had a maximum rate of not more than 6 cents for electrical energy in Omaha dating from January 1, 1917, the midst of the war.

Mr. LA FOLLETTE. Mr. President, it would seem, then, that the threat of public ownership and competition is sometimes sufficient to bring about reasonable rates to consumers from privately owned utilities.

Mr. HOWELL. Mr. President, potential public competition is indeed effective. More effective, of course, is actual public competition, and in every city of the country that has had the enterprise to establish a competing electric plant electric rates have been reduced to the domestic consumer about one-half by the competing company.

In the city of Cleveland in 1914 the people were paying 10 cents a kilowatt-hour. Ex-Secretary of War Baker was then mayor and was responsible for the construction of a competing municipally owned plant. What has been the result?

The maximum rate charged by the publicly owned plant is now 3 cents a kilowatt-hour, with a 30-cent service charge, and the private company has reduced its rates from 10 cents to 5 cents.

I imagine I can hear some one saying, "How about taxes?" And I appreciate that telepathic challenge. In the city of Omaha when a public utility pays its taxes it hands them over to the county and city treasurer, and thereupon he distributes such payments among several pockets. One is labeled "Police fund," another "Street-cleaning fund," another "General fund," and finally he gets down to a pocket that is labeled "Bond-redemption fund." In the case of Omaha's publicly owned utilities an increment is added to charges for service that will produce a fund in each case equal to the amount of taxes the utility might be called upon to pay if privately owned. Moreover, this fund as it accumulates is paid over to the county and city treasurer, but instead of distributing it into various pockets he adds it to the "bond-redemption fund" for the payment of the people's utilities debts. As a consequence the reduction in the rates enjoyed by the people of Omaha because of their publicly owned utilities can not be wholly attributed to the nonpayment of taxes.

Are these advantages of public ownership operative in connection with hydroelectric power developments?

The power plant of the hydroelectric installation involves a much larger investment of capital per horsepower than in the case of a steam plant. Therefore the first advantage of public ownership, the differential between the charges for private and public credit, is emphasized under such circumstances.

Hydroelectric plants cost anywhere from two to three times as much as steam-electric plants. Therefore it must be evident that this differential of 3¼ per cent runs, not against $100 per horsepower but against about $300 per horsepower.

Mr. FLETCHER. Mr. President, may I interrupt the Senator?

Mr. HOWELL. Certainly.

Mr. FLETCHER. Did I understand the Senator to state that the hydroelectric plant costs more than the steam plant?

Mr. HOWELL. Yes.

Mr. FLETCHER. I never quite understood that to be the case. Is that so everywhere or just at this place?

Mr. HOWELL. That is true, generally speaking. Much more money is invested in a hydroelectric plant, but there is not the same expense of operation. Less money would be invested in a steam plant, but there would be a greater cost of operation.

So far as the other two advantages of public ownership are concerned, they will be fully as operative. As a matter of fact, electrical utilities are about the most profitable in the country to-day. They even surpass gas, as the American public has been carefully drilled into the habit of paying high electrical rates. In fact, the people have accepted them on faith because of the stamp of approval by public service commissions. However, there is a gradual awakening, and hence the developing sentiment for public ownership which is abroad.

Nor is it strange that there is an awakening when we consider the relative charges for electrical energy in Ontario and in the United States, and the fact that Ontario rates are wholly due to public ownership.

Prior to 1913 there was organized in that Province an agency of the government known as the hydroelectric commission. It proceeded to buy and construct hydroelectric plants, and now owns and operates 22. It also transmits the energy developed, selling it wholesale at points of use. Thus, practically every municipality in Ontario owns its own electrical distribution system, buying and retailing the energy supplied by the transmission lines of Hydroelectric. These municipalities number about 284, and but three of them have privately owned plants, they being in competition with publicly owned systems. The largest of the hydroelectric power plants is located in the vicinity of Niagara Falls, and the wholesale charge to the city of Niagara Falls, Ontario, for energy delivered is 2.9 mills per kilowatt-hour. During 1926, domestic consumers in Niagara Falls, Ontario, used, on an average, 208 kilowatts per months at a cost of 1.2 cents per kilowatt-hour.

Mr. OVERMAN. Mr. President, what is the cost across the river, on the American side, where I understand the plants are privately owned?

Mr. HOWELL. Across the river is Niagara Falls, N. Y., served by privately owned utility, obtaining its electrical energy also from Niagara River, and they are charging for the same service about three times the rate in the Canadian city. This fact justly casts a suspicion on public regulation, and suggests the advantages of public ownership. Some one may suggest that the domestic consumer—that is, the voter in Ontario—is given undue consideration at the expense of the power users.

I have before me certain electric light and power bills. The following is an actual charge for use of 161 kilowatts per month in Niagara Falls, Ontario. The amount is $2.26 net. Across the river, in Niagara Falls, N. Y., served by a privately owned electric utility, also obtaining its hydroelectric energy from Niagara River, the bill for identically the same energy would be $6.21, not quite three times as much.

It is often urged that domestic users in Ontario are special beneficiaries of Hydroelectric, but that the power users pay the freight.

I have before me a power bill indicating a service charge for 23.7 horsepower and a consumption for the month of January of this year of 1,536 kilowatt-hours. The total of the bill for that month was $35.44. In Niagara Falls, N. Y., just across the river, the same bill would have been $41.47.

Again, let us consider a bill for a larger power in Niagara Falls, Ontario: Service charge, 622.5 horsepower; consumption, kilowatt-hours, 99,460; bill for the month, $1,090.48. In Niagara Falls, N. Y., the identical bill would have been $1,296.90.

I will make another comparison that is to me indeed striking:

Toronto is northeast of Niagara Falls, a distance of about 90 miles, a metropolitan city. St. Thomas is west of Niagara Falls, about 110 miles, and has a population of some 17,000. Each of these cities buys at Niagara Falls energy at about 2.9 cents per kilowatt-hour. The hydroelectric commission transmits it 90 miles to Toronto for an additional 1.1 mills; to St. Thomas for an additional 1.7 mills; so that the cost of electrical energy in Toronto is 4 mills and in St. Thomas 4.6 mills.

The United States Government has spent $50,000,000 in the construction and equipment of Wilson Dam at Muscle Shoals, Ala. It is now developing and selling electric energy at Muscle Shoals to the Alabama Power Co. for 2 mills per kilowatt-hour, or nine-tenths of a mill less than Toronto and St. Thomas pay for their energy at Niagara Falls.

The Alabama Power Co. has a transmission line connecting Muscle Shoals with Birmingham, Ala., a city of about 200,000 inhabitants and about 100 miles distant from Muscle Shoals, and it is probable that it can transmit the energy it purchases for 2 mills per kilowatt-hour from Muscle Shoals to Birmingham for not to exceed an additional 2 mills, making the total cost of Muscle Shoals energy delivered in Birmingham 4 mills per kilowatt-hour, or the same as the cost of energy delivered to the city of Toronto by the hydroelectric commission.

Here we have an excellent opportunity for comparison of the results of public and private ownership of hydroelectric plants, each consuming city located at about the same distance from the source of energy.

I have before me a bill for domestic consumption. Kilowatts used, 66. In Toronto the bill would be $1.41; in Birmingham, Ala., $5.05.

Incidentally, this same bill, if rendered in Washington, would be $3.89, or at the rate of about 6 cents per kilowatt-hour; that is less than in Birmingham. Mark you, Birmingham is supplied by water power, Washington by a steam electric plant. Congress has recently had an influence upon Washington rates. As a matter of fact, its influence has been growing for the last three or four years. When I first came to Washington, some four years ago, the rate was 10 cents per kilowatt-hour.

Mr. BROOKHART. Mr. President, will the Senator yield?

The PRESIDING OFFICER. Does the Senator from Nebraska yield to the Senator from Iowa?

Mr. HOWELL. I yield.

Mr. BROOKHART. I remember that the Senator made a speech on that proposition, and I also remember that following his speech the officials of the privately owned companies began to look around for a way to reduce their rates, because they did not want to have to pay anything back, as the Senator then suggested. That is the reason why the rates were reduced in Washington.

Mr. HOWELL. It must be evident that such a rate as 10 cents per kilowatt-hour in this city was utterly indefensible. It does not cost appreciably less to produce energy here to-day than it did in 1926, in 1924, or in 1923.

Small power: In Toronto the service charge for eight horsepower, kilowatts used per month, 1,355; bill in Toronto, $18.54; in Birmingham, Ala., $69.11. Consider this difference in connection with small power, and yet it is often urged in financial papers that while Ontario domestic consumers pay less than is paid in the United States, the power users pay more, or at least that is the suggestion.

Large power: In Toronto service charge for 657 horsepower, use per month 223,000 kilowatts, the bill in Toronto, $1,717.65; in Birmingham, Ala., $2,329.50; in Washington, D. C., $3,327.88.

Mr. President, here is evidence again of the advantages of public ownership and the burden of private ownership subject to legal regulation. It may be urged that it is unfair to compare Washington charges, where energy is produced by steam, with charges in cities supplied by hydroelectric power. Electric energy can be put on the switchboard at some of the great plants of the country, including all costs, not excepting capital, coal $4 per ton, for as low as 5 mills per kilowatt-hour. I was assured by the president of a great chemical concern the other day that a modern steam electric plant can be constructed and operated with coal at $4.15 per ton so as to put energy on the switchboard for 3.8 mills per kilowatt-hour.

However, assume the cost in Washington to be 6 mills per kilowatt-hour; then in such case the cost of hydroelectric energy in Toronto is but 2 mills less than the cost of steam electric energy in Washington. What has this difference of 2 mills to do with a rate of 6 cents charged to-day to the domestic consumers in Washington?

In the case of the 66 kilowatt-hour domestic bill I have quoted for Toronto, Birmingham, and Washington, the rate in Toronto is 21 mills. Add the additional cost on account of steam power, 2 mills, and we have 23 mills, or 2.3 cents, as compared to a rate of 6 cents in Washington.

It may be insisted that the Toronto bill does not include taxes while the Washington bill does. In the city of Washington the total taxes of the electric company for 1926 amounted to 3 mills per kilowatt of energy actually sold, which is more than the average for the country at large. Add those 3 mills to the Toronto rate and then we have 26 mills, or 2.6 cents, as a result of the public ownership of an electric plant using steam and paying taxes; this as compared to the 6-cent rate charged

in Washington. It might be added that in 1926 the average domestic rate in this country was about 7.4 cents per kilowatt-hour as compared with less than 2 cents in Ontario.

Mr. NORRIS. Mr. President, will my colleague yield?

Mr. HOWELL. Certainly.

Mr. NORRIS. In making the comparison which the Senator has made, it seems to me he omitted one thing where he accounted for taxes. He has said nothing with reference to the amortization fee that is included in the Toronto rate and not included in the Washington rate and which, as was shown here the other day, amounts to about 20 per cent of the rate paid.

In Ontario, Canada, the rate, although it is so much cheaper than the Washington rate, notwithstanding the Senator has added something for taxes, nevertheless includes an amortization fee which in 30 years would eliminate the entire capital investment, and under the Washington rate the capital investment, of course, never is eliminated.

Mr. HOWELL. Earlier in my remarks I called attention to the fact that in Omaha we set aside sinking funds equivalent to taxes. Of course, likewise, the sinking fund set aside by the hydroelectric commission, and in each case by the various municipalities throughout Ontario, is also in the nature of taxes. If the amount thereof is equal to the taxes that might have been collected, then the plants in Ontario are in effect paying taxes.

Mr. NORRIS. Mr. President, I have just spoken to my colleague, and I suggest to the Senator from Washington [Mr. JONES] that he make his motion now to proceed to the consideration of executive business, as my colleague is willing to stop now and finish his speech to-morrow.

Mr. JONES. Very well.

EXECUTIVE SESSION

Mr. JONES. I move that the Senate proceed to the consideration of executive business.

The motion was agreed to, and the Senate proceeded to the consideration of executive business. After five minutes spent in executive session the doors were reopened.

RECESS

Mr. JONES. I move that the Senate take a recess until to-morrow at 12 o'clock.

The motion was agreed to; and (at 5 o'clock and 15 minutes p. m.) the Senate took a recess until to-morrow, Saturday, March 10, at 12 o'clock meridian.

CONFIRMATIONS

Executive nominations confirmed by the Senate March 9 (legislative day of March 6), 1928

COLLECTOR OF INTERNAL REVENUE

George L. Foote to be collector of internal revenue for the district of Indiana.

COLLECTOR OF CUSTOMS

George D. Hubbard to be collector of customs for customs collection district No. 30, with headquarters at Seattle, Wash.

POSTMASTERS

CONNECTICUT

Clifford E. Chapman, Niantic.

KENTUCKY

Albert E. Brown, Pembroke.

OKLAHOMA

Ada M. Thompson, Mannford.

PENNSYLVANIA

Thomas Collins, Commodore.
Charles G. Fullerton, Freeport.

HOUSE OF REPRESENTATIVES

FRIDAY, *March 9, 1928*

The House met at 12 o'clock noon.

The Chaplain, Rev. James Shera Montgomery, D. D., offered the following prayer:

O Throne of God, we seek the highway whose starry path our feet would press. Thou dost look over this wonder-teeming world every day—morning and evening—and all things are made new. Yet there is nothing higher than the soul is high; there is nothing wider than the heart is wide. A life in Thee is more powerful, more pervasive, and more durable than all the eye beholds, for space is nothing to spirit. Let this little prayer ascend to a throne of grace. O for a life in Thee, deep, boundless, and abundant. "Ye shall know the truth, and the truth shall make you free." There is nothing finer, vaster, and more glorious than the knowledge of God's truth. Let the bigness of our lives, the richness of our service root and blossom in Thee. Through Jesus Christ our Lord. Amen.

The Journal of the proceedings of yesterday was read and approved.

MESSAGE FROM THE SENATE

A message from the Senate, by Mr. Craven, its principal clerk, announced that the Senate had passed the concurrent resolution (S. Con. Res. 12) appointing a committee to represent Congress at the exercises at Atlanta, Ga., incident to the unveiling of a portion of the Stone Mountain Monument, in which the concurrence of the House of Representatives was requested.

The message also announced that the Senate had passed with amendments a bill of the following title, in which the concurrence of the House was requested:

H. R. 9137. An act granting the consent of Congress to the highway department of the State of Tennessee to construct, maintain, and operate a bridge across the Cumberland River on the Lebanon-Hartsville Road in Wilson and Trousdale Counties, Tenn.

SENATE BILL AND CONCURRENT RESOLUTION REFERRED

A bill and concurrent resolution of the Senate of the following titles were taken from the Speaker's table and, under the rule, referred to the appropriate committees, as follows:

S. 2061. An act for the relief of W. H. Kaufman; to the Committee on Claims.

S. Con. Res. 12. Concurrent resolution appointing a committee to represent Congress at the exercises at Atlanta, Ga., incident to the unveiling of a portion of the Stone Mountain; to the Committee on Rules.

THE GREAT SMOKY MOUNTAINS NATIONAL PARK

Mr. ABERNETHY. Mr. Speaker, I ask unanimous consent to proceed for three minutes.

The SPEAKER. Is there objection to the request of the gentleman from North Carolina?

There was no objection.

Mr. ABERNETHY. Mr. Speaker, the country at large, I am sure, will be very much interested in the announcement that the Laura Spelman Rockefeller Memorial Fund has authorized a gift of $5,000,000 toward the establishment of the Great Smoky Mountains National Park. This gift, with the $2,000,000 gift from the State of North Carolina and approximately the same amount from the State of Tennessee and approximately the sum of $1,000,000 from private subscriptions, assures beyond question the establishment of this great playground and monumental natural area for the benefit, profit, and edification for this and future generations. [Applause.]

In this age of commercial materialism it is a hopeful sign to see such gifts as that from the Laura Spelman Rockefeller Memorial Fund. Having been privileged to report to the House the legislation establishing this great park, I take pleasure in announcing this gift. The great State of North Carolina, which I in part have the honor to represent, greatly appreciates this splendid and magnanimous gift.

Of this gift the Washington Post editorially on March 8 has this to say:

SMOKY MOUNTAINS PARK

The gift of $5,000,000 from the Laura Spelman Rockefeller Memorial Fund makes certain that the Great Smoky Mountains National Park will soon become a national asset. The amount, given as a memorial to Mrs. John D. Rockefeller, sr., will complete the $10,000,000 needed to purchase and turn the 700,000-acre tract over to the Federal Government. Within a few years a pleasure ground and beauty spot within easy reach of three-fourths of the population will be thrown open.

Although much of Great Smoky Mountains National Park is virgin forest land it lies in a region already famous. It is a part of the "Land of the Skies," which has been so successfully capitalized by North Carolina. Even before that section of the country became popular as a resort and vacation ground it was selected by some of the Nation's settlers as a place for their homes in the new country. The salubrious climate, the abundance of game, and the accessibility of water and fuel compensated the pioneers for the fact that they were forced to cling to the sides of the hills for their dwellings. Some of the purest American stock lives in the mountain territory.

The boundaries of the Great Smoky Mountains National Park will cover portions of Tennessee as well as North Carolina. It should, and no doubt will, attract residents of the entire eastern section. Its appeal may not be quite as varied as Yellowstone, but should prove fully as attractive to those unable to make the longer journey west. Linked with the Shenandoah National Park, the Great Smoky Mountains reservation will form an outlet almost at the gates of the National Capital for those who find pleasure and recreation in visiting nature at its best.